This is a digital copy of a book that was preserved for generations on library shelves before it was carefully scanned by Google as part of a project to make the world's books discoverable online.

It has survived long enough for the copyright to expire and the book to enter the public domain. A public domain book is one that was never subject to copyright or whose legal copyright term has expired. Whether a book is in the public domain may vary country to country. Public domain books are our gateways to the past, representing a wealth of history, culture and knowledge that's often difficult to discover.

Marks, notations and other marginalia present in the original volume will appear in this file - a reminder of this book's long journey from the publisher to a library and finally to you.

Usage guidelines

Google is proud to partner with libraries to digitize public domain materials and make them widely accessible. Public domain books belong to the public and we are merely their custodians. Nevertheless, this work is expensive, so in order to keep providing this resource, we have taken steps to prevent abuse by commercial parties, including placing technical restrictions on automated querying.

We also ask that you:

+ *Make non-commercial use of the files* We designed Google Book Search for use by individuals, and we request that you use these files for personal, non-commercial purposes.
+ *Refrain from automated querying* Do not send automated queries of any sort to Google's system: If you are conducting research on machine translation, optical character recognition or other areas where access to a large amount of text is helpful, please contact us. We encourage the use of public domain materials for these purposes and may be able to help.
+ *Maintain attribution* The Google "watermark" you see on each file is essential for informing people about this project and helping them find additional materials through Google Book Search. Please do not remove it.
+ *Keep it legal* Whatever your use, remember that you are responsible for ensuring that what you are doing is legal. Do not assume that just because we believe a book is in the public domain for users in the United States, that the work is also in the public domain for users in other countries. Whether a book is still in copyright varies from country to country, and we can't offer guidance on whether any specific use of any specific book is allowed. Please do not assume that a book's appearance in Google Book Search means it can be used in any manner anywhere in the world. Copyright infringement liability can be quite severe.

About Google Book Search

Google's mission is to organize the world's information and to make it universally accessible and useful. Google Book Search helps readers discover the world's books while helping authors and publishers reach new audiences. You can search through the full text of this book on the web at `http://books.google.com/`

Digitized by Google

Sci 1636.23

The Gift of
The New York State
Agricultural Society,
through
B. P. Johnson, Esq.,
of Albany.
Rec. Dec. 11,
1852.

Digitized by Google

Digitized by Google

Digitized by Google

Digitized by Google

Digitized by Google

TRANSACTIONS

OF THE

N. Y. State Agricultural Society,

WITH AN

ABSTRACT OF THE PROCEEDINGS

OF THE

COUNTY AGRICULTURAL SOCIETIES

VOL. X.—1850.

ALBANY:

CHARLES VAN BENTHUYSEN, PRINTER TO THE LEGISLATURE,

407 Broadway.

1851.

Digitized by Google

Sci 1636.23

Received 24 1851.

Gift of the Society

Digitized by Google

NOTICE.

The Tenth Volume of the Transactions of the Society is presented to the farmers of New-York, containing the proceedings of the State and County associations. It is believed that this Volume will be found to be one of great practical value to the farmer, and as containing much that will be useful to him in the management of his farm. It has been the sole object of the Executive Committee, in preparing the Transactions of the Society, to furnish articles from practical men, that are adapted to the necessities of our agriculturists, and that will enable them to improve. There are many papers of interest in this volume. The Survey of Seneca County, by J. Delafield, Esq., is a work of no ordinary ability. It is referred to with great pleasure, as embodying what is deemed useful and important in an agricultural survey, and its careful perusal cannot fail to make him who thus peruses it a better and more successful farmer.

The subscriber has been greatly assisted in the preparation of this volume by gentlemen who are deeply interested in the progress of Agriculture, and he sincerely regrets that the prescribed limits of the volume has alone prevented the publication of several valuable articles which have been furnished in addition to those published. The increasing demand, both at home and abroad, for the Transactions of the Society, is an indication of the importance attached to them, and renders it in the highest degree important that great care should be given to their preparation. While it cannot be claimed for this volume that there is no room for improvement, the subscriber believes that it can with safety be said,

Digitized by Google

that there is matter contained in it which is calculated to do good to the cause of Agriculture, and if carefully considered will lead to useful, practical results. It is submitted to the consideration of the farmers of New-York, with a hope that it may tend to lighten their labors, elevate in their own minds their profession, and eventually lead them on to higher attainments in all that constitutes a successful farmer.

B. P. JOHNSON.

Agricultural Rooms, February, 1851. *Secretary.*

Digitized by Google

CONTENTS OF VOLUME X.

1. Report of Executive Committee for 1850, ... 3
2. Report of Judges at Albany, ... 33
3. Annual Meeting, 1851, ... 111
4. Reports at Annual Meeting, ... 135
5. County Societies, ... 205
6. Communications, ... 317
7. Survey of Seneca County, by J. Delafield, ... 350
8. Agricultural Dynamics, a Prize Essay, by J. J. Thomas, 617
9. Analyses, by Dr. J. Salisbury, ... 710
10. The Regeneration of the Potato, by C. E. Goodrich, ... 719

I.

Report of Executive Committee, ... 3
Industrial Exhibition in London, ... 6
Agricultural Education, ... 7
Annual Fair, ... 8
Letter from the late President Taylor, ... 9
Address by Amos Dean, Esq., (Agricultural Education,) 14

II.

Reports at Albany, ...
Class A—Cattle.—Short Horns, ... 33
Devons, Herefords and Ayrshires, ... 34

Digitized by Google

Natives and Grades, Working Oxen, Steers, three years old, ... 35
Steers, two and one year old, Milch Cows, ... 36
Fat Cattle, Stall Fed, ... 37
Fat Cattle, Grass Fed, ... 39
Fat Sheep, Foreign Cattle, ... 40
HORSES.—All work, Draught, Thorough Bred, three year old colts, ... 41
Two and one year old colts, matched and Geldings, ... 42
Foreign Horses, ... 43
SHEEP.—Long and Middle Wooled, ... 43
Merinos and Saxons, ... 44
Natives and Grades, Foreign Sheep, ... 46
SWINE—POULTRY, ... 47
CLASS B.—Plows, trial of, ... 48
Description of Plows on trial, ... 49 57
Measurement of Plows, ... 58
Premium Plows, ... 59
Cuts of the Premium Plows, ... 61
Points in the construction of Plows to be investigated, 63
Mode of conducting trials of Plows, ... 65
PLOWING MATCH—FARM IMPLEMENTS, No. 1, ... 69
FARM IMPLEMENTS, No. 2, ... 70
FARM IMPLEMENTS, No. 3, ... 71
MACHINERY AND IMPLEMENTS, ... 73
HOARD AND BRADFORD'S PORTABLE STEAM ENGINE, ... 74
Decription of the Engine, ... 75
DAIRY—BUTTER.—Statements, Carey's, Fonda's, ... 76
Girls under 21, Catharine Lasher, Abbey C. Hall, ... 77
CHEESE—James Smealie's English Cheese, ... 77
SUGAR.—Isaac Burr's, ... 78
HONEY, BEE HIVES, GRAIN, FLOUR AND SEEDS, ... 79
VEGETABLES, ... 80
CLASS C.—DOMESTIC MANUFACTURES, No. 1, ... 81
do do No. 2 and 3, ... 82
MANUFACTURES, NEEDLE, SHELL AND WAX WORK, ... 84
FLOWERS, ... 88
APPLES AND PEARS, ... 89

Digitized by Google

Peaches, Plums, Quinces, &c., ... 90
Foreign Fruits, Animal Paintings,..... 91
Paintings and Daguerreotypes,..... 92
Class D.—Cooking and Parlor Stoves, ... 95
Silver Ware, Cutlery, and Britannia Ware,..... 96
Miscellaneous and Discretionary Articles, ... 97 106
Ross' Portable Burr Stone Mills, (description,)..... 105
Musical Instruments, ... 108
Report of Special Committee on articles omitted,..... 109

III.

Annual Meeting,..... 111
Election of Officers, ... 113
Fair recommended at Rochester, 1851,..... 113
Resolutions of Mr. Pardee, Patent Office Reports and seeds,.. 114
Life Members, Constitution amended, ... 115
Resolution for increased accommodations in old State Hall, .. 115
Reduction of tolls on Drain Tile, ... 115
Committee on Rufus Comstock's alleged discovery, ... 116
Report of committee,..... 133
Awards of Committees,..... 116
Annual Address, A. J. Downing,..... 119
Resolution of thanks by Dr. Beekman,..... 127
Address of E. P. Prentice, President,..... 128
Address of J. Delafield, President, on assuming the chair,.... 131
Resolution of thanks to E. P. Prentice, by Col. Morris,..... 133
Application to Legislature for Agricultural School, ... 133
Meeting Executive Committee, New Board,..... 134

IV

Reports Committees—Annual Meeting, ... 135
Butter and Cheese.—Report of H. Wager, ... 135
Alderney Butter,. 136
Wheat and Oats.—Report of Committee, ... 136
Statement William Hotchkiss, (wheat,)..... 136
Statement Samuel L. Thompson, (wheat,)..... 138
Statement Justus White, (wheat,)..... 139
Statement H. B. Bartlett, (oats,)..... 140

Digitized by Google

Statement G. K. Eells, (oats,) 140
INDIAN CORN.—Report Committee, ... 141
Statement P. Crispel, Jr., ... 142
Statement Robert Eells, ... 143
POTATOES AND ROOT CROPS.—Report of Committee, ... 145
Statement H. B. Bartlett, potatoes, ... 145
Statement Nahum Taft, do 146
TIMOTHY SEED AND TOBACCO, ... 147
BARLEY, BEANS AND PEAS, ... 148
Statement E. M. Bradley, barley, ... 149
Statement A. R. Dutton, beans, ... 149
Statement E. M. Bradley, peas, ... 150
TREASURER'S REPORT, ... 152
FRUITS.—Report of Committee—List of Fruits recommended, 161
MANAGEMENT OF FARMS.—Report Committee—Questions to be answered, ... 167
Roswell Harmon's Farm, Wheatland, ... 169
D. D. T. More's Farm, Watervliet, ... 178
Description of farm and its cultivation, ... 178
Answers to questions proposed, ... 181
Notice of farm and its management, ... 190
Elisha M. Bradley's Farm, East Bloomfield, ... 190

V.

County Societies—Remarks, ... 205
Allegany Report, ... 206
Pine Apple and Shipping Cheese, method of manufacture, ... 208
Town association—Centerville, ... 209
Cayuga, Election of Officers, ... 314
Chautauque Report, ... 210
Report of Committee on Sheep, ... 210
Chemung, Letter from Hon. E. C. Frost, ... 211
Chenango, Report, ... 213
Mr. Pendleton's statement of Corn crop, ... 215
Clinton, Report, ... 215
J. Battey's statement relative to Transplanting Shade Trees, ... 216

Digitized by Google

J. Battey's statement relative to Transplanting Pear Trees, ... 218
Columbia, Report, ... 219
Extract from Hon. J. S. Gould's report on discretionary articles, ... 220
Extract from J. Sutherland's Address, Agricultural Education, ... 221
Cortland, Report, ... 222
Dairy Cows, ... 223
Resolutions on death of William Randall, Esq., ... 224
Delaware, Report, ... 224
Dutchess, Report, ... 225
Statement of five acres of Indian Corn, A. L. & H. P. Allen, ... 227
Erie, Report, ... 227
Farm of John Raynor, Clarence, ... 228
Essex, Report, ... 229
Fulton and Hamilton, Report, ... 232
Greene, Report, ... 233
Genesee, Report, ... 235
Herkimer, Report, ... 236
Extract from Address of Hon. Ezra Graves, Agricultural Science, ... 237
Jefferson, Report, ... 239
Extract from report on Farms, Dairies and Nurseries, .. 240
Farmers' Homes, by Hon. G. R. Fairbanks, ... 248
Extract from Address of Jason Clark, Ex-President Society, Agricultural Education, ... 250
Lewis, Report, ... 252
Extract from Address of Hon. Caleb Lyon, of Lyonsdale, 253
Madison, Report, ... 256
Lewis Raynor's statement of Wheat Culture, ... 258
Montgomery, Report, ... 315
Niagara, Report, ... 259
Statement, Farm Crops of M. C. Crapsey, ... 260
Oneida, Report of President, ... 262
Report of Secretary, ... 263
Extract from report on Horses, ... 263

Digitized by Google

Extract from Address of Hon. T. Jenkins,..... 264
Onondaga, Report, ... 266
Extract from Address of Hon. D. C. Le Roy, Application of Science to Agriculture, ... 266
Characteristics of the present age,..... 268
Ontario, Report, ... 269
Extract from Prof. Norton's Address, Farmers' Education, ... 270
Value and Application of Science,..... 271
Orange, Report,..... 274
Orleans, Report,..... 276
Oswego, Report,..... 277
Summary of Mr. Murray's Address, ... 279
Otsego, Report, ... 280
Agricultural School recommended,..... 281
Statement of crops, Indian Corn, Peas, ... 282
Queens, Report,..... 283
Rensselaer, Report,..... 284
Richmond, Report, ... 288
System of Farming on Staten Island,..... 289
Farmers' Club,..... 290
Guano, its effect on Wheat Crop, ... 291
Potatoes, experiments as to proper depth to plant,.... 291
Draining, beneficial results,..... 292
Drain Tile Machine, ... 292
Rockland, Report,..... 293
Saratoga, Report,..... 294
Memorial for Agricultural College,..... 295
Farm crops, statement, ... 296
Seneca, Report, ... 296
Report on Flour and Grain,..... 299
Yield of Flour from five different varieties of Wheat,.. 300
Soles Wheat and Stokum wheat,..... 300
Suffolk, Report,..... 301
Sullivan, Report,..... 302
Tioga, G. H. Barstow on Farming, ... 302
Robert Howell, Pine and Hemlock land for Crops,.... 303
Ulster, Report,..... 304

Digitized by Google

Premium crops, ... 305
Washington, Report, ... 305
Silk and Cocoons, report, ... 306
Wayne, Report, ... 307
Farms for premiums, ... 309
Wyoming, Report, ... 309
Science applicable to practical farming, ... 310
Yates, Report, ... 332

VI.

Communications.

Jersey or Alderney Cow, by Col. J. Le Couteur, Belle Vue Jersey, ... 317
Scale of points for Premium Bulls and Cows, ... 318–19
Old Jersey Cow, ... 321
Beauty, Prize Cow of improved breed, ... 322
Defects remedied by judicious crossing, ... 322
Management and treatment of cows, ... 324
Yield butter weekly, ... 325
Price of Pure Bred Bulls and Heifers, ... 326
Composition of the Milk of the Jersey Cow, by E. Emmons, M. D., ... 326
Analysis Ayrshire Cow's Milk, by Prof. Thompson, ... 326
Analysis Jersey Cow's Milk, E. Emmons, M. D., ... 326
Butter from Jersey Cow's Milk, ... 327
Analysis city milk for common use, ... 327
John A. Taintor's description of his Jersey Cow, and manner of feeding, ... 327
Wire Fences, by Hamilton Murray, President Oswego Agricultural Society, ... 328
Potato Disease, by Gardner Cox, East Pierrepoint, St. Lawrence county, ... 329
How can sound and healthy Potatoes be raised, ... 336
Storage of Potatoes so as to preserve them, ... 337
Recapitulation of article, ... 338
Analysis of the Jerusalem Artichoke, by J. H. Salisbury, M. D., 339
Per centage water, dry matter, and ash, ... 341
Composition of ash of tubers, ... 342

Digitized by Google

Amount of inorganic matter removed from soil, ... 344
Articles necessary to restore the loss,..... 344
Nutritive power of the Tubers, ... 346
Comparison with the Potato, ... 346
Analysis of the dry Tubers,..... 347
'Analysis of the Parsnip, by J. H. Salisbury, M. D., ... 347
Per centage of water, dry matter, and ash,..... 348
Analysis of the ash of the roots and tops,..... 348
Inorganic matter, removed from soil,..... 348
Composition to restore the loss,..... 348
Organic composition, ... 349

VII.

Survey of Seneca County, by J. Delafield.

Report of Committee by Dr. Beekman,..... 350
Agricultural societies, benefits derived from,..... 559
Improved system suggested,..... 562
Spirit of,..... 563
Fairs, advantages of,..... 559
Agriculture, early condition of, and deterioration, ... 481
Indian, the condition of,..... 386
Source of the main elements of happiness,..... 414
Agriculturist, American, A. B. Allen, Editor,..... 541
Alum, native mineral at the falls of Lodi, and method of preparing the artificial salts, ... 465
Analysis of alum shale, ... 610
Grain seeds,..... 616
Grass seeds,..... 616
Limestones, ... 610
Marls, ... 611
Soils of farms, ... 613
Springs,..... 473
Water lime,..... 610
Assessed value of the county, ... 405
Average products of the county,..... 550
Bacon, Joel W., introduces improved stock, ... 533–534
His farm, ... 535
Barley, product of each town, ... 418

Digitized by Google

Barley, cost of production, ... 551
Barns and sheds, ... 516
Bear, Samuel, an early settler, his mill, ... 398
Bennett, James, an early settler, ... 397
Bitumen, ... 464
Board and lodging of farm laborers, ... 549
Boardman, A., an early settler, ... 396
Bonedust manure, ... 542
Braden, Lewis, his stock, ... 534
Buckwheat, product of each town, ... 418
cost of production, ... 552
Burial places of the Indians, ... 388
Butter, products of each town, ... 418
Demand and supply, ... 544
Canada thistle, ... 512
Canoga spring, nitrogen gas, ... 471
Capital, its nature and value, ... 555
Catharines town destroyed, ... 379
Cattle and other stock, ... 530
Number in the county, ... 418
Cayuga lake, ... 409
Bridge, ... 411
Census of 1850, ... 417
Chamberlain's quarries, ... 444
Champlain's exploits in Canada, ... 360
Character of the early settlers of the country, ... 396
Cheap farming condemned, ... 499
Cheese, product of each town, ... 418
Chess, the tares of scripture, ... 513
Civilization, its introduction, advance and progress, ... 358
Climate, ... 494
Clover, analysis of, ... 616
Coe, John D., Devon cattle, ... 531
Corn, product of each town, ... 418
Cost of production, ... 553
Analysis of, ... 616
Counties of the State organized, ... 403
Covert, Isaac, his quarries, ... 463

Digitized by Google

Covert, early settlement of the town, ... 396
Drift surface,..... 476
Industrial pursuits of,..... 419
Products of,..... 418
Cranberry swamp,..... 415
Crane, Ezekiel, adventures and death of,..... 399
Crops of the county, principal, ... 493
do do in 1849–50,..... 418
Cost of production,..... 550
Average products per acre, ... 550
Crooked Lake, the waters of,..... 411
Cultivator, the, Luther Tucker, Editor, ... 541
Dairy, the, ... 543
Devonshire cattle, ... 530
Drainage, ... 519
Drain tiles and pipes, ... 521
Drift deposits, ... 475
Dublin, the spring at,..... 473
Dunlap, Andrew, an early settler,..... 392
William, do 393
Durham, or Short Horn cattle, ... 532
Dutch enterprizes in America, ... 358
Eastman, Dr. J. L., of Lodi,..... 533
Education, its condition in Europe, and progress in the State of New-York,..... 604
Eggs, consumption of,..... 547
Emigration, motives for,..... 389
Encrinal limestone,..... 455
Essay on rural life, ... 578
Relation of vegetation to the seasons,..... 580
Expenses of farming,..... 547
Various crops,..... 550
Experiments encouraged,..... 563
Falls of Lodi, fossils,..... 467
Native alum, ... 465
Fallows, ... 486
Farm accounts, ... 549
Buildings,..... 516

Digitized by Google

Farms, number of in the county, ... 483
Size of, ... 483
Wages, ... 555
Farming population of the United States, ... 415
Fayette, town organized, ... 405
Industrial pursuits of, ... 419
Products of, ... 418
Drift deposit of, ... 476
Faussett, George, early settler, ... 392
Feeding and fattening, ... 535
Fences, ... 519
Field of peace, ... 388
Fish of the lakes, ... 410
Flax crops, ... 418
Fodder, ... 535
Fortifications, Indian, ... 388
Fossils of the county, ... 468
Foster, H. T. E., his farm, ... 517
Fruit, propagated by the Indians, ... 387
Fruit and fruit trees, ... 601
Effects of climate, ... 602
Genesee Farmer, I. Rich, Jr., Editor, ... 541
Genesee slate, ... 461
Geneva in 1790, ... 397
Geography of the county, ... 403
Geology of the county, ... 434
Geological Map, ... 480
Gibson, W. T., ... 357
Grasses, ... 503
Green, John, an early settler, ... 398
Gristmill, the earliest, ... 395
Gypsum group, ... 439
Halsey, Silas, his early voyage from Long Island, ... 394
Hamilton group, ... 452
Hay crops, ... 418
Cost of production, ... 553
History of the county, ... 356
Hominy block, account of, ... 393

Digitized by Google

Horses, ... 537
Hudson, Hendrick, his enterprizes, ... 359
Human labor, ... 526
Implements, ... 526
Indian corn, indigenous, ... 386
Crops of, ... 418
Cost of production, ... 553
Indian John, old, his conduct and fate, ... 399
Indians, advance of knowledge among the, ... 376
Agricultural condition, ... 386
Character, ... 359
Causes of extinction, ... 376
Religion and superstition, ... 372
Arts practiced, ... 371
Industrial pursuits, ... 414
Table of, alphabetical, ... 419
Insects, ... 522
Johnston, John, ... 517, 520, 533
Jones, Horatio, an early settler, ... 397
Junius, its settlement, ... 399
Products of, ... 418
Drift deposit of, ... 476
Jury districts, ... 406
Kieft, Governor, his cruelties and death, ... 365
Kenne, Elijah, early settler, ... 395
Labor and wages, ... 555
Laborers, ... 557
Land speculations, ... 384
Leonard's quarries, ... 463
Lime, deficient, ... 488
One effect of, ... 490
Limestone, encrinal, ... 455
Seneca, ... 447
Tully, ... 457
Analysis, ... 610
Lodi, early settlement, ... 391
Falls of, ... 409
Drift deposit of, ... 476

Digitized by Google

Lodi, products of,..... 418
Industrial pursuits,..... 419
Machinery,..... 527
Manures, management and uses,..... 540
Marcellus shales,..... 444
Marls, analysis of,..... 615
Meadow grasses, ... 508
Mechanics, ... 527
Migratory character of Americans,..... 390
Milk, its constituents,..... 545
Mills, the first erected,..... 395
Meteorology, ... 424
Money, its value,..... 555
Montour, Catharine, some account of, ... 379
Montreal in 1535,..... 386
Moral condition of the early settlers, ... 396
Morris, Lewis G., his visit,..... 575
Moscow shales, ... 455
Norton, Professor J. P., his Elements of Agriculture, ... 502, 536
Address before the county society in Oct., 1850,..... 585
Oaklands, meteorological observations,..... 430
Oat crop in each town,..... 418
Cost of production, ... 551
Ocean, inland, once covered western New-York,..... 438
Old Indian John, his fate, ... 399
Olive shales,..... 453
Onondaga salt group, ... 439
Ovid, early settlement of,..... 392
Industrial pursuits,..... 419
Products of,..... 418
Drift deposit,..... 476
Pasture and hay grounds,..... 502
Grasses, ... 507
Manuring, ... 507
Phadoc, Geo., adventures of,..... 400
Phosphates, their importance,..... 491
Supply, &c.,..... 598
Primary source, ... 492

Digitized by Google

Pigeon weed, ... 511
Plaster of Paris, ... 439, 500, 504
Plowing, ... 501
Plows, ... 528
Population, effect of, ... 527
Excess of, ... 527
Potato, indigenous, ... 387
Affected by climate, ... 581
Crops, ... 418
Present attention to, ... 497
Poultry and eggs, ... 546
Practice, essential, ... 563
Pratt, Col., his quarries, ... 462 and 464
Pre-emption line, ... 404
Preface, ... 356
Premiums, agricultural, ... 561–567
Prentice, E. P., his stock, &c., ... 533
Principal crops, ... 493
Proceedings of the Seneca County Agricultural Society in 1850, 565
Products of the county, ... 418
Profits of farming, ... 547
Of farms of 100 acres, ... 553
Of farms well worked, ... 554
Prospect Hill, Lodi, ... 391
Puritans, escape from England, ... 362
Embarkation, voyage, and landing at Plymouth, ... 363
Rain, average fall of, ... 426
Reaping machine, ... 528
Red Jacket, ... 409
On the fall of his tribe, ... 385
Reeder, Dr. Henry, ... 539
Rivers and creeks, ... 408
Roads, ... 406
Romulus, products of, ... 418
Industrial pursuits of, ... 419
Drift deposit, ... 476
Rose, Dr., late of Rose Hill, ... 539
Rotation of crops, ... 500

Digitized by Google

Rural New-Yorker, D. D. T. Moore, Editor, ... 541
Rye, crops of, ... 418
Cost of production, ... 552
Grass, ... 507
Sackett, Hon. G. V., ... 533, 534
Salt, in the soil, ... 486
Scawas village, ... 398
Science, advantages of, ... 415, 484
Scott's Corners, ... 463
Seed imperfect, ... 499
Seneca County, Agricultural Society, early condition of, and its progress and transactions, ... 560–565
Fertility of, ... 389
Organization of, ... 404
Products of, ... 418
Industrial pursuits, ... 419
Seneca Falls, early settlement, ... 398
Products of, ... 418
Industrial pursuits of, ... 419
Drift deposit, ... 476
Seneca Indians, history of, ... 368
Battle at Newtown, ... 378
Destroyed politically, ... 382
Extinction of, ... 385
Seneca lake, ... 407
Does not freeze, ... 407
Its outlet, ... 411
Seneca limestone, ... 447
Seneca river, ... 408
Shear, Stephen, ... 534
Sheep, ... 538
Sheldrake Point, ... 410
Sherwood, Col., of Auburn, ... 533
Short Horn, or Durhams, ... 532
Smith, Peter, an early settler, ... 396
Smith, Asa, do 399
Smith, Jason, ... 399
Smith, Capt. John, in 1604, ... 358

Digitized by Google

Societies, agricultural, a benefit to the State, ... 559
Southwick, O., ... 534
Soils, ... 484
Analyses of various, ... 610
Comparison of various, ... 596
Speculation in Indian lands, ... 384
Springs, explained, ... 468
Canoga, ... 471
Mr. Van. Loo's, ... 473
Mr. A. Bascom's, ... 473
Daniel Youngs, ... 473
Dublin, ... 473
Mr. Southwick's, ... 473
State Agricultural Society, its happy influences, ... 482
Stuyvesant, Governor, his prudence, ... 365
Sullivan, General, his expedition, ... 378
Swabey, Frederick, his quarries, ... 441
Swift, General Joseph G., ... 357
Swine, protection of, ... 518
Breeds of, and uses, ... 539
Taxes of the county, ... 405
Temperature, ... 428
At Oaklands, ... 431
At Seneca Falls, ... 432
At Penn Yan, ... 432
Threshing, cost and economy, ... 517
Transactions of the State Society, ... 541
County society, ... 565
Tremain, Philip, an early settler, ... 395
Tremper, Judge, of Dresden, ... 357
Tobacco, useless, except as a stimulant to industry, ... 414
Towns of the county, ... 405
Number of acres in each, ... 405
Tully limestone, ... 457
Tyler, O., plaster beds, ... 442
Tyre, early settlement, ... 399
Products of, ... 418
Industrial pursuits of, ... 419

Digitized by Google

Tyre, drift deposit, ... 476
Waste lands, ... 412
Vail, George, his stock, ... 533
Van Cleef, L., an early settler, ... 397
Van Lew's quarry, ... 463
Gas spring, ... 474
Varick, products of, ... 418
Industrial pursuits, ... 419
Drift deposits, ... 476
Waste lands, ... 413
Vegetable matter, its importance, ... 486
Vegetation, its relation to seasons, ... 580
Waste lands, ... 412
Waterloo, early settlement, ... 398
Products of, ... 418
Industrial pursuits, ... 419
Drift deposits, ... 476
Wages, explained, ... 555
Governing principles, ... 556
Means for sustaining, ... 557
Weddle, Thos., imported stock, ... 533
Weeds, ... 511
Wells, their depth, &c., ... 478
Whartenby, B. F., drain tiles, &c., ... 520
Wheat, earliest export, ... 395
Crops of, ... 493
Cost of production, ... 550
Fly, injurious, ... 522
Its structure and changes, ... 586
Premium crop, ... 566
Grain and straw, ... 589
Harvesting, ... 590
Soils, ... 592
Drilling, ... 587
Harvest from 1822 to 1850, ... 433
Consumption of by the mills, ... 423
Plant, its powers of exhalation, ... 492
Wilkinson, Jemima, ... 395

Digitized by Google

Williamson's quarry, ... 464
Willson, James, an early settler, ... 393
Wisher, David, an early settler, ... 393
Witchcraft in Europe, ... 373
Indian, ... 372
Woodworth, Erastus, an early settler, ... 396
Wool, products, ... 418
Clip of 1849, ... 539
Consumed at the factories, ... 423
Wuchter's quarry, ... 444
Wyckoff, Nicoll H., mills, &c., ... 409
Yost, John, Caspar, and George, erect a mill at Scawas, ... 398

VIII.

Prize Essay on Agricultural Dynamics, by J. J. Thomas.

Introduction, ... 617
Principles of mechanics—Inertia, ... 619
Attraction, ... 624
Gravitation, ... 624
Cohesion, ... 628
Woods, ... 629
Metals, ... 630
Centre of gravity, ... 633
Simple machines, ... 639
The law of virtual velocity, ... 639
The lever, ... 641
Wheel and axle, ... 646
The pulley, ... 649
The inclined plane, ... 650
The wedge, ... 655
The screw, ... 655
Application of mechanical principles, ... 656
Plows, ... 660
Models of machines, ... 662
Friction, ... 663
Results with the dynamometer, ... 665
Friction wheels, ... 669
Lubricating substances, ... 669

Digitized by Google

Principles of draught, ... 671
Hydrodynamics, ... 673
Velocity of water in ditches, ... 681
Levelling instruments, ... 683
Hydraulic machines, ... 685
Waves, ... 687
Appendix to hydrostatics and hydraulics, ... 690
Specific gravities, metals, stones and earths, ... 691
Woods—dry, ... 691
Miscellaneous, ... 692
Weights of a cubic foot of various substances, ... 693
Bulk of a ton of various substances, ... 693
Contents of cisterns, ... 694
Pneumatics, ... 696
Winds, ... 699
Moving powers, ... 702
The force of heat, ... 707

IX.

Analyses of the rock, &c., of the farm of Dr. J. A. Paine, ... 710
Composition of the rock, ... 711
Cultivated soil north of ditch, ... 712
Cultivated orchard soil, ... 713
Sand, underlying the peat, ... 714
Composition of peat, ... 715
Composition of the water of the farm, ... 717

X.

The Regeneration of the Potato, ... 719
Potatoes from Bogota in New-Grenada, ... 719
Culture of Bogota seedlings, in 1849, ... 720
Their culture in 1850, ... 721
Culture of home seedlings in 1849, ... 724
Culture in 1850, ... 725
Home seedlings of 1850, ... 726
A Chili potato, ... 726
Recapitulation, ... 728
General suggestions, ... 728

Digitized by Google

ILLUSTRATIONS.

View of Show Grounds, ... Frontispiece.
Short Horn Cow, Ruby, ... 36
Hungarian Cow, ... 40
Premium Plows, ... 61
Hoard & Bradford's Portable Steam Engine, ... 74
Plan of D. D. T. More's Farm Buildings, ... 189
Jersey Bull and Jersey Cow, ... 318–19
Old and Improved Jersey Cows, ... 321–22
Illustrations of Survey of Seneca County .....

ERRATUM.

Page 116, Winter wheat, S. L. Thompson, 84¼ bush. 4 qts. and 1 pt. on two acres.

Digitized by Google

LIFE MEMBERS, 1851,

BY THE PAYMENT OF FIFTY DOLLARS OR MORE.

BEEKMAN, J. P., Kinderhook, $100.
BELL, THOMAS, Morrisania.
BUEL, WILLIAM, Rochester.
CORNING, ERASTUS, Albany, $100.
DELAVAN, HENRY W.,* Ballston.
FELLOWS, JOSEPH, Geneva, $150.
GREIG, JOHN, Canandaigua.
LENOX, JAMES, New-York, $460.
LE RAY DE CHAUMONT, J.,* Le Raysville.
LIVINGSTON, EDWARD P.,* Clermont.
McINTYRE, ARCHIBALD, Albany.
McINTYRE, J. McDONALD, Albany.
PRENTICE, EZRA P., Mt. Hope.
ROTCH, FRANCIS, Butternuts.
RUST, PHILO N., Syracuse.
SEWARD, WM. H., Auburn.
SHERWOOD, JOHN M., Auburn.
TOWNSEND, JOHN, Albany, $100.
TUCKER, LUTHER, Albany.
VAIL, GEORGE, Troy.
VAN RENSSELAER, STEPHEN,* Albany.
VAN RENSSELAER, STEPHEN, Albany.
VAN RENSSELAER, WM. P., Beaverwick.
WADSWORTH, JAMES,* Geneseo, $100.
WADSWORTH, JAMES S., Geneseo, $200.
WADSWORTH, WM. W., Geneseo, $75.

* Deceased.

Digitized by Google

OFFICERS FOR 1851.

President,
JOHN DELAFIELD, Seneca.

Vice Presidents,
WILLIAM BUEL, Monroe,
SILAS M. BURROUGHS, Orleans,
LEWIS G. MORRIS, Westchester,
ANTHONY VAN BERGEN, Greene,
SAMUEL CHEEVER, Saratoga,
HENRY WAGER, Oneida,
BENJAMIN ENOS, Madison,
RAY TOMPKINS, New-York.

Mr. Augustus L. Clarkson declined the appointment of Vice President, and Samuel Cheever, of Saratoga, was appointed in his place.

Corresponding Secretary,
B. P. JOHNSON, Albany.

Recording Secretary,
J. McD. McINTYRE, Albany.

Treasurer,
LUTHER TUCKER, Albany.

Executive Committee,
JOHN B. BURNET,
M. G. WARNER,
JOSIAH W. BISSEL,
BENJ. B. KIRTLAND,
AMBROSE STEVENS.

Ex-Presidents, ex-officio Members.
J. M. SHERWOOD, GEORGE VAIL,
LEWIS F. ALLEN, JOHN A. KING,
E. P. PRENTICE.

Digitized by Google

CONSTITUTION OF THE NEW-YORK STATE AGRICULTURAL SOCIETY.

The style of this Society shall be "The New-York State Agricultural Society." Its objects shall be to improve the condition of Agriculture, Horticulture, and the Household arts.

SEC. 1. The Society shall consist of such citizens of the State as shall signify in writing, their wish to become members, and shall pay on subscribing not less than one dollar, and annually thereafter one dollar, and also of Honorary and Corresponding members.

The Presidents of County Agricultural Societies, or a delegate from each, shall ex-officio be members of this Society.

The payment of ten dollars or more shall constitute a member for life, and shall exempt the donor from annual contributions.

SEC. 2. The officers of the Society shall consist of a President, eight Vice Presidents, one to be located in each Judicial District; a Recording Secretary, a Corresponding Secretary, a Treasurer, an Executive Committee, to consist of the officers above named, and five additional members, and five of the Ex-Presidents shall be ex-officio members of the Executive Committee, and these five shall consist of the five Ex-Presidents whose term of office has last expired, of whom three shall constitute a quorum; and that the Ex-Presidents of the Society, not members of the Executive Committee, shall constitute a Board of Councillors, to which may be referred, for consultation and advice, all questions that may from time to time arise, and in the decision of which the Society may in any manner be interested; and a General Committee, the members of which shall be located in the several counties, and be equal to the representations in the House of Assembly.

SEC. 3. The Recording Secretary shall keep the minutes of the Society. The Corresponding Secretary shall carry on the corres-

Digitized by Google

pondence with other Societies, with individuals, and with the general committee, in the furtherance of the objects of the Society.

The Treasurer shall keep the funds of the Society, and disburse them on the order of the President or a Vice-President, countersigned by the Recording Secretary, and shall make a report of the receipts and expenditures at the annual meeting in January.

The Executive Committee shall take charge of and distribute or preserve all seeds, plants, books, models, &c., which may be transmitted to the Society; and shall have also the charge of all communications designed or calculated for publication, and so far as they may deem expedient, shall collect, arrange and publish the same in such manner and form as they shall deem best calculated to promote the objects of the Society.

The General Committee are charged with the interests of the Society in the counties in which they shall respectively reside, and will constitute a medium of communication between the Executive Committee and the remote members of the Society.

Sec. 4. There shall be an annual meeting of the Society on the third Wednesday of January, in the city of Albany, at which time all the officers shall be elected by a plurality of votes and by ballot, with the exception of the General Committee for the counties, which may be appointed by the Executive Committee, who shall have power to fill any vacancies which may occur in the officers of the Society during the year. Extra meetings may be convoked by the Executive Committee. Fifteen members shall be a quorum for the transaction of business.

Sec. 5. The Society shall hold an Annual Cattle Show and Fair at such time and place as shall be designated by the Executive Committee.

Sec. 6. This Constitution may be amended by a vote of two-thirds of the members attending any annual meeting.

State Agricultural Rooms, *January* 16, 1851.

I certify the above to be a true copy of the Constitution of the New-York State Agricultural Society.

B. P. JOHNSON, *Cor. Secretary.*

Digitized by Google

LIBRARY ADDITIONS, 1850

Purchased.

Horticultural Register, by Paxton, (London.) 2 vols.
Horticultural Register and Farmers' Magazine, (Boston.) 4 vols.
Helsham's Lectures on Natural Philosophy, (1777, London.)
Phylologie Universelle des plantes, Paris. 5 vols.
Elon's Survey of the Turkish Empire, (London, 1799.)
New-York Farmer, (vols. 5, 6, 7, 8, 9.) 5 vols.
Silk Culturist. 2 vols.
Wood's Botany.
British Almanac and Companion, 1850.
Kirby and Spence's Entomology.
Westwood's Entomological Text Book.
The Domestic Fowl, by Richardson.
Johnson and Shaw's Almanac, 1850.
Liebig's Animal Chemistry.
Padder's Farmers' Land Measurer.
The American Fowl Breeder.
Guenon's Treatise on Milch Cows.
American Agriculturist. 3 vols.
Buckland's Geology and Mineralogy. 2 vols.
Humboldt's Views of Nature.
Year Book of Facts, or Annual of Scientific Discoveries.
Dickson's Poultry.
Taylor's Farmers' School Book.
Lawrence's New Farmers' Calendar, 1809, (London.)
Roget's Bridgewater Treatise on Animal and Vegetable Physiology. 2 vols.
Chase's Cosmogony and Geology.
Dictionary of Scientific Terms.
Hoffman's Directory, 1850–51.
Rodes' New-York Directory, 1850.
Dana's Mineralogy, 3d edition.
Dixon's Ornamental and Domestic Poultry, (London.)
Farmer's Magazine, 1850.
Farmer's Guide, (Stevens and Norton.) 2 vols.
Nolan's Poultry, (Dublin.)
McMahon's Gardening.

Digitized by Google

Agricultural Addresses before Essex Agricultural Society, Mass., 1822–1825.
The Gardener's Magazine of Botany, vol. 1st and 2d.
Good's Family Flora.
Horticulturist.
The Gardeners' Chronicle.

Donations.

American Poultry Yard, Browne's, A. H. Hill, Albany.
International Agency, through Mons. A. Vattemare.
Annals Royal Horticultural Society, Paris, (from Society.) 8 vols.
Bulletin Central and Agricultural Society, Paris, (from Mons. Poyen, Perp. Sec'y.) 2 vols.
Memoirs National and Central Agricultural Society, (from Society.) 3 vols.
Count de Gourcy's Agricultural Voyages in Belgium and France, (Author.) 1 vol.
Second Tour in England, (Author.) 1 vol.
Cure of Potatoes, 1849, Mons. Tolland.
Watering Trenches in the Pyrrenees, M. A. Jaubert.
No More Vine Props, Andrie Michaux.
Ohio Fruit Convention, 1849, F. R. Elliott, Cleveland.
Comptroller's and Treasurer's Report, New-York, W. Hunt, and A. Hunt.
American Biographical Sketch Book, vol. 1st, E. H. Pease & Co., Albany.
Senate and Assembly Journals and Documents, 1849, 13 vols., B. P. Johnson.
North American Pomological Convention, 1849, J. A. Kennicott and F. R. Elliott.
American Association of Science, Proceedings, E. H. Pease & Co., Albany.
Legislative Documents, Mass., Wm. Bacon, Richmond.
The Poultry Book, by John C. Bennett, M. D., Philips, Sampson & Co., Boston, by E. H. Pease & Co., Albany.
Memoirs Pennsylvania Ag. Society, 1824, A. S. Roberts, Phila.
Norton's (Prize Essay,) Elements Scientific Agriculture, (Author.)
Report of Congress Fruit Growers, 1849, A. Chandler, N. Y.
International Agency, through Mons. A. Vattemare.
Cours de Agriculture, by Emile Jamet, (from Minister of Commerce,) Paris.
Manuel de L'Eleveur de Bêtes.
De la Culture Du Murier, by M. MF. Boyer.
Traité de la Culture de Murièr, by J. Charrel.
Maison Rustique, du XIXe Siècle. 5 vols.
Traité des Magnanesies, by J. Charrel.
Etudes Hippologiques, by Eug. Gayot.
Agriculture Française Départment de L'nde.
Cours D'Horticulture, by A. Poiteau.

Digitized by Google

Report par M. Casimer Perier, Commerce &c., de Belgium.
Petit Traité de Compatabilité Agricole, by E. De Granges De Rancy.
Catéchisme de Chimie et de Géologie, by Prof. Johnston.
Traité des Amendments et des Engrais, by P. Joigneaux.
Dialogues Populaires, sur Le Droit Rural, by P. J. De Valserres.
Maladie des Pommes de Terre, by M. J. Decaisne.
L'Agriculture Allemande, &c., by Royer.
Guide des Propriétaires, Le Cte De Gasparin.
Concours d'Aremain de Boucheni, A. Poisy.
Rapport Général Domestication des Animaux, by M. I. Geoffroy, Saint Hilaire.
James Higgins, M. D., Report as State Ag. Chemist of Maryland.
Prof. J. Henry, Smithsonian Institute, Washington, Essay of Benj. Apthorp Gould, Jr., on the planet Neptune.
Commerce and Navigation U. S., 1849, Hon. J. L. Schoolcraft.
Sixty-third Annual Report Regents New-York, T. R. Beck, M. D.
Legislative Documents Vermont, Geo. F. Houghton, Esq., St. Albans.
Webster's High School Dictionary, E. H. Pease & Co., Albany.
President Taylor's Messages 1849, and Documents, Hon. J. L. Schoolcraft.
Laws of Vermont, 1849, Thompson's Vermont, 2d and 3d Reports of Geology of Vermont, and Legislative Documents and Pamphlets, Geo. F. Houghton, Esq., St. Albans.
From C. M. Saxton, 123 Fulton st., New-York—Allen's American Farm Book, Allen's History of Domestic Animals, Buist's Kitchen Gardener, Brown's American Poultry Yard, Miner's Bee-Keeper's Manual, Dana's Essay on Manures, Brown's American Bird Fancier, Prof. Johnston's Lectures on Agriculture.
Report of Secretary United States, on the Trade in Guano, Hon. D. S. Dickinson.
Loudon's Encyclopedia of Agriculture, H. W. Vail, Islip, L. I.
Geography of Vermont, Message of the Governor, 1850, &c., G. F. Houghton, Esq., St. Albans.
Annals Lyceum Natural History N. Y., No. 1, vol. 5, J. H. Redfield, Secretary.
Map of Dutchess County, Gen. T. L. Davies, Poughkeepsie.
Proceedings Penn. Horticultural Society, W. D. Brinkle, Phila.
Prof. Johnston's Report on the Agriculture of New-Brunswick, R. Jardine, Esq., St. Johns.
Catalogue of Yale College, 1850, E. C. Herrick, Librarian.
Constitution, By-laws and Catalogue Troy Lyceum, J. McConnihe, Esq.
Legislative Documents, Mass., Wm. Bacon, Esq., Richmond.
Patent Office Report, 1849, Part 1st, Hon. John A. King, and Asbury Dickens, Esq.
Report of Secretary of War on Geology and Geography of California, Asbury Dickens, Esq.

Digitized by Google

Transactions Worcester Agricultural Society, 1850, and Dictionarium Rusticum, 2 vols., John W. Lincoln, Esq., Worcester, Massachusetts.

Patent Office Report, 1849, Part 2d, Agriculture, Hon. J. L. Schoolcraft and Hon. J. A. King.

Hovey's Magazine,	1850,	C. M. Hovey & Co., Boston.
Boston Cultivator,	do	O. Brewer, Boston.
Mass. Ploughman,	do	Messrs. Buckminsters.
New England Farmer,	do	J. Nourse.
Maine Farmer,	do	E. Holmes.
American Agriculturist,	do	Saxton & Blanchard.
Working Farmer, N. Y.,	do	Kingman, Cross & Co.
Municipal Gazette,	do	E. Meriam.
Arts Echo, N. Y.,	do	Kingsley & Longbottom.
Sabbath Rocorder, N. Y.,	do	Uttee & Brown.
Syracuse Journal,	do	V. W. Smith.
Moore's Rural New-Yorker,	do	D. D. T. Moore, Rochester.
Genesee Farmer,	do	J. Rich, Jr.
Wool Grower, Buffalo,	do	T. C. Peters.
Ohio Cultivator,	do	M. B. Bateham.
Michigan Farmer,	do	W. Isham.
Prairie Farmer,	do	Wright & Wight.
Wisconsin Farmer.	do	H. Miller.
Valley Farmer, St. Louis,	do	Woodward & Abbot.
Southern Cultivator,	do	Augusta, Ga.
Roman Citizen,	do	Sandford & Co.
Granite Farmer,	do	State Ag. Soc. New-Hampshire.
American Farmer,	do	S. Sands, Baltimore.
Canadian Ag'l Journal,	do	Wm. Evans, Montreal.
Canadian Agriculturist,	do	McDougal and Buckland, Toronto.
Du Page Co. Recorder,	do	Naperville, (Ill.,) Barnes, Thompson & Keith.
Mark Lane Express, Lond.,	do	Wm. Shaw.
North British Agriculturist,	do	Edinburgh.

Digitized by Google

State of New-York.

No. 150.

IN ASSEMBLY, FEB. 4, 1851.

COMMUNICATION

From the Corresponding Secretary of the New-York State Agricultural Society.

STATE AGRICULTURAL ROOMS,
February 4th, 1851.

To the Hon. HENRY J. RAYMOND,
Speaker of the Assembly:

In pursuance of the acts of the Legislature for the promotion of Agriculture, I present herewith the annual report of the New-York State Agricultural Society, with the proceedings of the Executive committee, and abstracts of the reports of county societies for 1850.

Very respectfully yours,
B. P. JOHNSON,
Cor. Secretary.

Digitized by Google

Digitized by Google

TRANSACTIONS

OF THE

New-York State Agricultural Society

REPORT OF THE EXECUTIVE COMMITTEE FOR 1850.

TO THE LEGISLATURE OF THE STATE OF NEW-YORK.

The Executive Committee of the New-York State Agricultural Society, pursuance of the act for the encouragement of Agriculture,

RESPECTFULLY REPORT:

That the Transactions of the State and county societies which are herewith submitted, exhibit the progress which has been made during the past year in these associations, in advancing the interests of Agriculture. In no year since the appropriation was made by the Legislature, for the encouragement of Agriculture, has there been so much interest manifested by the farmers and mechanics of the State, in their efforts to sustain the State and county associations. The exhibitions have been in the highest degree encouraging; and the improvements resulting from the organized and united efforts of those desirous of advancing our agricultural interest, have been most cheering. It was not to have been expected, that any change would immediately result from these efforts. The progress of improvement in every department of Agriculture, must be slow—and it is desirable that it should be so—sudden and great changes lead often to large expenditures, and frequently to disastrous results. The farmer is jealous, therefore, of those movements which promise much to little effort; and waits until time has demonstrated the truth or falsity of the plans suggested.

Digitized by Google

The exhibitions of the past year, have brought together the results of several years' operations; and no one who has carefully examined the exhibitions of stock, farm implements, and domestic manufactures, which have been presented, but what will acknowledge, that in these there has been a most commendable and desirable advance. Many, who have been slow to acknowledge the benefit of these associations, have with a frankness and candor, in the highest degree creditable, acknowledged that the evidences of improvement are so manifest, the results of these associations so salutary, that they are deserving of the encouragement and support of all who wish well to their country's best interests.

It is not too much, we think, to affirm, that the improvements made in the branches of Agriculture alluded to, would much more than overbalance the amount which has been contributed to sustain these associations. In addition, however, to these, the improvement upon the farm itself, the increased crops which have been raised, the neatness and order introduced upon so many farms in every section of the State, will add largely to the amount which has been secured to the citizens of this State, in the improvements which have been effected. We are now in a position, with far less labor than formerly, to advance this great interest—we have added to our number yearly many true and ardent friends, and the difficulties which in the commencement of our operations were many, have mostly passed away—and united and vigorous effort now, will accomplish far more than at any former period; from the success that has attended our efforts, we feel encouraged to go forward with redoubled energy and endeavor still more to advance this great interest.

In carrying forward the operations of the State Society, it has been the constant aim of the Executive Committee to recommend no measures or practices which were not warranted by enlightened and intelligent experience, and to encourage those which had stood the test of experiment, and would in all probability be productive of positive benefit to the community. They are gratified in the assurance that many of the measures which they have recommended in relation to the management of the farm, the dairy, and the breeding of cattle, &c., have been successfully put in practice, and the results are being satisfactorily developed in various portions of the State.

The general operations of the Society have been similar to those of previous years, and are detailed in our annual report of last year. In our Transactions which were then submitted to the Legislature, allusion was made to the lectures of Prof. Johnston, and the prize essay of Prof. Norton. Those works have been before the public for some months, and the ex-

Digitized by Google

pressions of approbation which have been given by many of the most distinguished men in our country, justifies in all respects the appreciation in which they were regarded by the Executive Committee of the Society. The conclusion of the survey of Washington county by Dr. Fitch, fully sustains the opinion as to its advantages to the agricultural interest.

In the Transactions which are now submitted to the Legislature, will be found a survey of the county of Seneca, made by John Delafield, Esq., and we desire to call especially the attention of farmers and all interested in Agriculture to this most valuable work. From this survey and that of Dr. Fitch, the propriety and importance of the analysis of soils will be most apparent; the connexion between geology and Agriculture is most manifestly exhibited in the survey of Mr. Delafield, and will be seen in the collection and arrangement of the rocks and soils prepared for the museum of the Society; and the aid which the farmer can derive from these surveys is so apparent, that a continuance and completion of the survey of the whole State will only be delayed from the want of means and men suited to this particular work.

The importance of collecting together the various implements in use, the seeds and grains grown in our State, as well as those from other portions of the world, led to the establishment of a museum. It has been increased during the past year by many valuable additions, and it is necessary that enlarged accomodations should be furnished for this purpose, as the rooms devoted to this object are now filled. It is believed that the Legislature when apprized of this fact, will make the necessary appropriations for the purpose, and a plan will be submitted by which it is believed, the necessary accommodations can be provided in the building where the collection is at present arranged, that will be entirely sufficient for the Cabinet of Natural History as well as the Agricultural Society. This is now a place of resort to the farmer, when in the city; here he can make his inquiries with the articles before him, and here too he may receive and exchange seeds, grain, &c., and thus benefit himself as well as others.

The contributions to the museum during the past year, have been of a varied and interesting character. Commodore T. Ap Catesby Jones, of the United States Navy, presented a valuable collection of seeds, and specimens of grain, from California, and very extensive collections of cereal grains and corn, from counties in our own State, have also been added. The premium plows, and other implements of Agriculture, have been placed in the rooms, and several valuable and useful works have been added to the Library of the Society, which is becoming a very valuable one, in its agricultural character.

Digitized by Google

TRIAL OF PLOWS.—The Executive Committee feeling the importance of testing, accurately and thoroughly, the plows in use, so as to arrive at some satisfactory results, in regard to those best adapted to the wants of the farmer, appointed a committee, distinguished for their intelligence, and practically acquainted with the subject, to superintend the trial. The month of June was selected for the trial, and ample time was afforded, for a thorough investigation of the whole matter. Upwards of forty plows, comprising some of the best in use, were submitted at the trial, and the committee have performed their duties in a manner entirely satisfactory to the Officers of the Society, and it is believed, to the public. It was a matter of just congratulation, to find so many truly valuable implements in use. The report of the committee which is submitted, will show the nature of the trial made, and the results at which the committee arrived; and it is believed that the plows to which the premiums offered by the Society have been awarded, will, under like circumstances, perform all that can be desired, and that until some new and important improvements shall be effected, it cannot be necessary to institute other trials. There are various questions, however, which arose upon the trial, which will require further investigation, which will be attended to in due time by the Officers of the Society.

GREAT INDUSTRIAL EXHIBITION IN LONDON, 1851.—The institution of an exhibition of the industrial products of the world, under the patronage of His Royal Highness, Prince Albert, is an event of no ordinary importance, in the history of our world. The preparations for this exhibition, by citizens of England, are upon the most extensive scale, and the results of this friendly competition among the nations of our globe, cannot but prove in the highest degree encouraging and salutary. Feeling the importance of this exhibition, the Executive Committee appropriated the sum of $400, to be awarded to the members of the Society, who should successfully compete at the Exhibition, and they are happy to announce, that nearly one-half of the contributors from this State, are members of the Society; and they are assured from the committee who have had the selection of the articles to be sent, that they are highly creditable to the ingenuity and talent of our countrymen. Believing that this exhibition will have a most beneficial influence upon the nations of the world, in tending to make them better acquainted with each other, in showing them their dependence upon each other, in advancing the industrial pursuits of each, and in binding them together by stronger ties, the Executive Committee have felt desirous that our countrymen should as far as practicable, be present, and witness the display that will there be made; not doubting, that our ingenious

Digitized by Google

countrymen will bring from this world's exhibition, much that will be useful to their own country, and will also have their views enlarged, as to the capabilities and progress of other nations, much older than our own.

JOURNAL OF THE SOCIETY.—The Executive Committee have long felt the want of some medium through which they could communicate monthly their proceedings. They have been permitted to publish abstracts of their proceedings in the papers of the city, but could not find space sufficient to give their proceedings in detail. The correspondence of the Society affords every month, matters of interest, which though not of a character strictly adapted to the Transactions, yet of interest to the public, and deserving of being preserved. It was in view of these and other considerations, apparent to every observer, that the Executive Committee commenced a monthly journal of eight pages, in which is published the proceedings of the Committee and of the Society, which is circulated among the Officers and life members of the Society, county societies, correspondents, papers who exchange with us, and foreign societies with which they are in correspondence. They are happy in being assured from friends at home and abroad that the journal is the very thing needed, and that its continuance is looked for with great interest.

AGRICULTURAL EDUCATION.—The establishment of an institution connected with a farm, has been brought before the Legislature at its two previous sessions by His Excellency Gov. Fish, and a board of commissioners, appointed by him, made a report to the last Legislature recommending the establishment of an institution. A committee in the House of Assembly was appointed, composed of one member from each judicial district, and had the subject under consideration and reported favorably, with a plan for the institution; the late period of the session at which the report was presented, as well as the great pressure of business, prevented its being acted upon. It is believed that the Legislature, in accordance with the recommendation of the Governor and the prayer of numerous petitioners, were desirous of establishing an institution which should be adapted to the wants of the agricultural class, and as but one opinion upon the propriety and importance of such an institution has been expressed, it is hoped that early measures will be adopted to secure its establishment.

In no country more than this, is it of importance that the agricultural class should be thoroughly educated. Here the farmer is in most instances the owner of the soil, is acquainted practically with the management of his estate, but too often from want of that knowledge which he might obtain from a well conducted institution, he loses the benefit which otherwise might enable him far more successfully to prosecute his labors; to enable him

Digitized by Google

then to attain all that is desirable, an institution and experimental farm is all important—and to what nobler end could the resources of the State be devoted than to this? The more the science of Agriculture is investigated, the more advantageous will it be found to the farmer, and whatever the practical skill of the farmer may be, still the application of science will make him a better farmer, and the better enable him to reap the reward from his labors to which he is entitled by a right course of husbandry. It is of the highest importance to the farmer to take into account the nature of his soil, and this will require him to possess sufficient acquaintance with geology to ascertain its qualities, and although the experience of our best farmers will enable them to decide generally as to the crops best suited to their soils, still the great advantage which would result by educating our young men, and thus prepare them to ascertain the facts which are so important to them, cannot we think be questioned.

ANNUAL FAIR AT ALBANY.—The tenth Annual Fair and Exhibition of the Society, was held at the city of Albany, on the 3d, 4th, 5th, and 6th of September. This is an occasion of no ordinary interest to the farmers and mechanics of our State, not only, but to every class of our citizens, and it is here that they have an opportunity of examining the progress which has been made. It is the assemblage of the farmers at our Annual Fairs, in such numbers, that encourages reward, sustains the Society in exertions commensurate in some measure, at least, with the great interests committed to their charge.

Amidst the vast assemblage that thronged the show grounds, joyous, active, and intelligent, there was one void, that gave the keenest regret, not only to the Society, but to the people. Deprived by the fatigue consequent upon a severe sickness, at the fair in 1849, of the attendance of General Taylor, that illustrious man had cherished as one of the pleasantest hopes, the expectation of mingling with the farmers of New-York, at their great Festival, in 1850. He had spoken on repeated occasions, of the intense interest which he felt in the pursuits of Agriculture; and this was among the impressive and most gratifying features of the age—that one of its most distinguished and successful warriors, should find the labors and management of the farm, one of the most interesting themes of study, and conversation. A wisdom beyond that of mortal, had ordered his footsteps otherwise, and the Society and the people were deprived of the opportunity so fondly desired by them, of extending to him the cordial welcome of the assembled farmers of the State and of the Union. One of the last acts of President Taylor's life, was a letter prepared by him, in answer to one from the President of the Society. The correspondence is annexed.

Digitized by Google

MOUNT HOPE, ALBANY, *May* 18, 1850.

HIS EXCELLENCY, Z. TAYLOR, *President U. S.;*

Sir,—The New-York State Agricultural Society was greatly disappointed, that the state of your Excellency's health, did not allow you to become its guest at Syracuse, last autumn. The Society and farmers of New-York, however, flattering themselves that their disappointment was attributable only to temporary indisposition, have hoped that the welcome they had prepared for their Chief Magistrate, was only postponed—not lost. Acting as their organ, as the presiding officer of the State Society, and in accordance with an unanimous vote passed at the last meeting of the Executive Board, I have now the honor of repeating the invitation for the Show, to be held near this city, during the first week in September next. You, sir, have taken too deep an interest in the great objects to which the Society is devoted, to make it necessary for me to say more than to assure your Excellency, that no part of this great Republic could give you a more cordial reception than will await you at this great farmers' festival.

I am, sir, with great respect, &c.,

E. P. PRENTICE.

WASHINGTON, *July* 5, 1850.

E. P. PRENTICE, *Esq.*, *Albany*, *N. Y.;*

Sir,—I have duly received your favors of May 18th, and June 25th, the former, wishing me to attend the Annual Fair of the New-York State Agricultural Society, in September next, the latter, kindly asking my company at your house, on that occasion. In the extreme uncertainty attending the adjournment of Congress, until which event, I cannot leave the seat of government, I find it quite impossible to give any assurances in regard to my presence at the State Fair. I was greatly disappointed, when circumstances prevented my attendance at the Fair of last year, and it is my hope, this season, to have the gratification of witnessing a similar exhibition. Unless prevented by an extraordinary prolongation of the session of Congress, or by other circumstances, not now foreseen, I shall certainly comply with the invitation which you have extended me, as President of the Agricultural Society. I fear, however, that I shall be obliged to decline your very kind request, that I should make your house my home, during my attendance at the Fair. It will hardly be in my power to accept any private invitations, but should I do so, that of Gov. Fish, which I some time since received, would have the strongest claim upon my attention.

With many thanks for your hospitable offer, I remain yours, &c.,

Z. TAYLOR.

Digitized by Google

The duties consequent on the session of Congress, prevented the Society from being honored with the presence of Mr. Fillmore, the President of the United States, who expressed his deep interest in the proceedings of the Society, and whose co-operation in its work had previously often been manifested, and who honored the Society by his attendance the previous year.

The Society in every year of its existence, has felt the encouragement afforded by the liberality of the State. It is this which has served to place it upon the firm basis on which it stands, it has sustained and cheered those who have borne the labor, and has set in motion a thousand influences of good, the benefits of which are felt by every farmer in the State. Exceedingly gratifying in connection with this, is the personal attendance of the Chief Magistrate and the State officers, and the members of both branches of the Legislature, as members of the Society, which has been given as well at this Fair as at several of those which have preceded it.

Among the eminent strangers who attended this Fair for the purpose of seeing the concentration of the agricultural interests, so strongly represented in the immense gathering of all that could be desired to assist the working man, and to illustrate his success, the Society have a peculiar pleasure in placing in this, their official record, the name of Mr. LAFAYETTE, the grandson of the truly great man who assisted to prepare this Western world for its career of prosperity. It was the occasion of great congratulation, that this gentleman, himself an honorable member of the Legislative Assembly of France, should have mingled with the farmers of New-York in this, their great assemblage.

Nor was it less fortunate that another eminent literary man, G. P. R. James, of England, was there also, to witness, and with great satisfaction as we are assured he did, the vast crowd, met for the benign purpose of adding strength to the policy most useful and advantageous to all the people, thronging every part of the great arena, devoted to the purposes of the Fair, governed only by the silent, but most powerful, because intelligently known and willingly obeyed influence of the laws.

There were in attendance delegates and others from twenty-two States of our own country, and from the Provinces of New Brunswick, Nova Scotia, Canada East and West. This was a much larger attendance than heretofore, and was peculiarly gratifying, affording as it did the cheering evidence of the increasing influence of our Society.

By the enterprising arrangements of the press the incidents of the Fair, were during every hour of its progress known to the Nation at large. The grounds for the Fair were happily selected and skillfully arranged under the direction of the President of the Society. The various tents and halls

Digitized by Google

were crowded with the offerings brought for exhibition by a very largely increased number of competitors; it was a task of no ordinary description to thread a passage through the throng, and the labors of the committees, discharged with an intelligent fidelity, were not unattended with difficulty. It would be difficult to assign to any one department of the Fair more than to another, the superiority, as having most attracted the notice of the people. Alike to the useful and ornamental, the labors and rewards of the farmers' life, their attention was given. Floral Hall, in which every form of beauty was combined, under the direction of Dr. Herman Wendell, of Albany, was the object of unceasing admiration. The attendance at this Hall is gratifying in its indication of the wide diffusion of an advancing taste, in respect to the garden and the orchard as valuable appendages of the farm.

The vicinity of the Fair to the Eastern States, drew to it the presence of a great number of visitors from that region of intelligence and enterprise; they expressed the liveliest interest in the success of the Society, and in many instances were active competitors for the premiums. Their assistance as judges was most valuable, and in all respects their action did much to impress the great truth, that in efforts to advance the best interests of the community, the lines of geographical division become too faint to be practically regarded.

Never was the attendance so great. The people seemed literally to have come up to the Fair, as an occurrence of national interest, and to have come there with the enlightened zeal of men rejoicing in every evidence of the improvement and prosperity of the cause for the advancement of which the Fair was instituted. Many years had passed over the Society, since the Annual Fair had been held at Albany. When last held at the Capital of the State, it was almost in its infancy. In the interval, the Society had, by the generous action of the Legislature, and more than all, by the confidence of the people, gained the vigor of full manhood; and it was now at Albany, the greatest gathering of those devoted to the agricultural interests of the country, ever witnessed in the new world. It was an agreeable reflection, that so many of the former Presidents, officers, and members of the Society, were in attendance, to witness the fruition of their labors.

There was a praiseworthy zeal exhibited for the premiums offered by the Society, and their possession is regarded throughout the Union, as an evidence of real merit. To make these premiums even more acceptable, to increase their variety, number and value, to extend them more and more,

Digitized by Google

into all the departments of labor and art, connected with the culture of the earth, is a duty too evident for the Society to neglect.

The address was delivered to a large and attentive audience, assembled under the great tent of the Society, by AMOS DEAN, Esq., of Albany.

The subject discussed, was that of Agricultural Education. His address was characterized by his strong good sense; it will be found embodied in these Transactions, and will be read with interest. It worthily succeeded the long list of discussions on this subject in successive years before the Society; which, when gathered, as they will be at some future day, will exhibit a volume, whose value to the best interest of the agricultural class, and of mankind, will be acknowledged by all.

For successive years, Fairs held in the length and breadth of the State, have fully developed the gratifying, the honorable fact, that the people will sustain generously and cordially, the great cause of Agriculture. It is no longer an effort or a theory. The approving voice of the Representatives of the People, the attendance of the honored and the wise of the land, the intelligent approbation of that great power, the press—and more than all the presence of the people in numbers, hitherto without precedent, on similar occasions, all these demonstrated, that the people have a heart at unison with the farmer, to aid, to cheer, to encourage him in his great work of cultivating the earth, which every department of human action, confesses "the mother of us all."

The Fair of 1850, in its successful results, is a voice of encouragement for the future, as well as approbation of the past. The wish of the friends of Agriculture, will never be completed, till whatever is in the treasure house of science, that can benefit the farm, or the farmer himself, is taken thence. With the advance of agricultural knowledge, the great interests of the State are indissolubly connected. To the Society, the path of duty is an evident, though it will doubtless always be as it has been, an arduous one. But while from year to year, the people give the Society the strongest proofs of their approbation, the labor, however arduous, will be cheerfully given. Improvement of Agriculture, is but another name for the increase of the general prosperity and happiness of the nation.

At the close of the address of Mr. Dean, the following resolutions were adopted:

On motion of Hon. O. Phelps, of Canandaigua,

Resolved, That the thanks of the Society be tendered to Amos Dean, Esq., for his able and eloquent address just delivered, and that he be requested to furnish a copy of the same for publication in the Transactions of the Society.

Digitized by Google

On motion of Mr. Johnson,

Resolved, That the thanks of the Society be most cordially tendered to the gentlemen and ladies who have acted as Judges, and who have so faithfully discharged the arduous duties devolving upon them.

Resolved, That the Society is under great obligations to the Exhibitors from our own State, and adjoining States, as well as from the Canadas, who have made this one of the most valuable and interesting exhibitions ever presented to the farmers of the State and the Union.

The receipts and expenditures of the Society, will be found detailed in the annual report of the Treasurer of the Society.

The incidental expenses connected with the Fair, and paid by the Society, arose from the use of steam power, a new feature in the exhibition, and which contributed largely to the interest and usefulness of the mechanical portion of the exhibition. The erection of stalls for cattle, was a measure never before adopted, and also caused a large expenditure. It was a measure, deemed advisable to test, and the Executive Committee are satisfied that it causes an expenditure more than sufficient to counterbalance the advantages derived from it, and they would suggest the propriety of discontinuing it in future.

The trial of plows, which took place in June, and was continued for about ten days, also incurred an expenditure of considerable amount, as noticed in the Treasurer's report, but which was one which, in the opinion of the committee, will be abundantly returned to the farmers, by the results of the investigation which has been so thoroughly made.

All of which is respectfully submitted,

B. P. JOHNSON,
Corresponding Secretary.

Digitized by Google

ANNUAL ADDRESS.

The Society was called to order by the President, E. P. Prentice, Esq., under the spacious tent of the Society, and a very impressive prayer was offered up by the Rev. Dr. Pohlman, of the Lutheran Church, Albany.

The President addressed the Society as follows:

Gentlemen of the New-York State Agricultural Society,—We are witnesses this day that it was not all curse which condemned man to eat bread in the sweat of his face, and where shall we find such an accumulation of evidence as this assembly—this whole ground presents.

We are witnesses to the faithfulness of His promise, who has said, seed time and harvest shall not cease—His goodness has crowned another year, and it becomes us as well to acknowledge that goodness as to rejoice in it.

I may congratulate you upon the result of another year's effort—upon this great, this magnificent show, and upon its increasing importance as a Fair as well as a show. Here do people now come from all sections of the country to buy and sell, as well as to see and show—to get gain, as well as ideas, and who shall estimate the influence for good this Society has already exerted, and is yet destined to exert in both these particulars upon the moral, social, and industrial interests of our State and country.

Many other of the States, stimulated by our example, have already similar organizations within their own bounds, which are exerting a very benign influence there and reflexly.

I may congratulate you upon the great number of distinguished strangers from other countries as well as the different States of our own Union, who have honored us with their presence and aid; and more, may congratulate you upon the presence of the faithful friends from a neighboring government who are with us now, as at other times, and to whom we are again, as always, greatly indebted. In your name I tender them *all* our grateful acknowledgments.

When we were last assembled on an occasion like the present, my honored predecessor called your attention to a letter he had then just received from

Digitized by Google

the President of the United States, expressing his regret that, in consequence of ill health, he should not be enabled to attend that meeting as he had expected and as we had *all* hoped.

The Society had again extended to him its invitation, and had received his answer, expressing not only his unabated interest in it and its objects, but his determination, circumstances permitting, to be present with us at this time. But alas, that letter was his last, and what was to us one year ago hope deferred, is now hope destroyed. The wise, the honest, the patriotic President Taylor, as you are all aware, is numbered with the dead, and we mourn, not only as citizens of this great republic, the loss of a beloved chief magistrate, but as members of this Society, a friend and associate, for he was not more a soldier and statesman than he was a farmer,—than one of us; but while it becomes us to bow with submission to this afflictive dispensation of Providence, we are consoled by the reflection that one of our own tried and chosen fellow citizens now occupies the Executive chair—a fellow citizen every way worthy the exalted position.

He, too, in warm terms, has expressed his sympathy and desire to be with us, and but for an extraordinary prolonged session of Congress, would, no doubt, have been here now. But gentlemen, we are not left without the honor of having even that dignified station represented here, in our neighbor, the cultivated, and now *more* dignified farmer of Kinderhook.

But let me not anticipate the learned and eloquent speaker, who has kindly consented to address us on this occasion, or longer keep you from the feast he has prepared.

AGRICULTURAL EDUCATION.

ADDRESS DELIVERED BY AMOS DEAN, ESQ.

Mr. President and Gentlemen of the State Agricultural Society:—There are occasions when it well becomes one, who even stops at a just appreciation of what is due to himself, to thank God that he was made a man; to feel from the very depths of his soul an earnest gratitude when he is reminded that he belongs to the civilized portion of a race to whom were committed the destinies of this planet; to a race, endowed, on the one hand, with great physical, intellectual and moral powers; and clothed, on the other, with corresponding responsibilities.

And these occasions, too, are those in which the destinies of that race, so far as all its elements of progress are concerned, are immediately involv-

Digitized by Google

ed. They are those in which we behold immense masses of men moving on together for the accomplishment of some great industrial, political or moral purpose; in which the fires are re-lit, and the steam newly put on, to give the cars, in which human destinies are freighted, a fresh start on the railroad track of time.

I need hardly add, that the present is emphatically one of those occasions; and one too possessing an interest corresponding only to its immense importance.

In the hasty selection of a topic to present for our mutual consideration, I have thought that none, perhaps, might be more acceptable, as I am sure none can be more deeply interesting, or important, than the subject of AGRICULTURAL EDUCATION,—*the training up of the mind with a special reference to the pursuits of Agriculture.*

TO EDUCATE means to *lead forth*, to *bring up*, to *train*, to *improve*, to *add new or stronger susceptibilities and energies to the powers originally possessed by the individual.*

All education must be addressed to a man's mind, but there is nothing about him that is not susceptible of being educated. Not only may his mind be trained to think, but his body may also be taught to labor; and both repay, in the most ample manner, all the educational means and appliances expended on them.

It is a fact to which all history attests, that man's achievements, always and every where, have been accomplished either by his large head, or his stalwart body; have been wrought out either by the thought of his mind, or the labor of his muscle. And the last has ever acted in subjection to the first. It was made to do so, as it is secondary in its nature, and originally designed to execute what the first had conceived. All that man has ever yet succeeded in bringing forth and perfecting, had a previous existence as the subject of his thought.

The misfortune has generally been, that the owners of both these sources of results, have seldom been the same. The thinking head has almost invariably found its way to other shoulders than those upon which has rested the doom of physical labor. Thus the thought of the mind, and the labor of the muscle, of the same individual, have had a long separation from each other.

Physical labor has been found almost always attached to the car of authority. In obedience to its stern commands it has cultivated the soil, exhausted itself in the workshop, plowed the ocean, and wrought the mine. It has erected for others' benefit enduring structures. On the Nile's fertile banks, in our world's very infancy, it piled up the pyramid, erected the

Digitized by Google

palace and the temple, scooped out the catacomb, and shot up the obelisk. Anterior even to historic records, it ascended through the passes of the Caucasus, traversed the length of Siberia, crossed the Straits of Bhering, strolled down the Mississippi's valley, stayed awhile its progress in the ancient city of the Aztecks, and travelled by the side of the Andes to Ancient Peru, scattering all along its course its sepulchres, tumuli, mural defences, and pyramidical structures, thus almost literally girdling the globe with its mighty monuments.

The effect of this separation has been to render the one a despot, and the other a slave; to degrade bodily labor, even while it was furnishing to the man of thought the very means that rendered his continued existence here possible.

It is the belief of many in modern times that it may be safe to commit the guidance of the body to its own head; that labor may be the best directed, and most efficient in practical results, when placed under the dominion of its own mind; in other words, that head and body, mind and muscle, may be safely committed to each other's keeping, and be permitted to journey on together in agreeable companionship, so long as the one can devise, and the other execute, things that are essential to their common good. This may seem an amusing statement, but it is nevertheless the grave problem of the age, and the most important one presented for solution to the nineteenth century.

The world's thinking has been hitherto done in comparatively few minds. In making this assertion I exclude from the domain of thought all those business acts that are done from day to day, perhaps to the end of a long life. The performance of these comes to be little more than mere matters of habit, and hence are independent of original thought. The ideas and opinions that are passing current in society, what are they but the echoes of other minds? A truly original thought would find itself a stranger in many minds that pretend to think.

I exclude also from thought that entire train of ideas that is constantly passing through the mind of a waking man. They are mere day dreams, coming without an effort, and passing away without the accomplishment of any good result. It is the power of reasoning, of reflecting, of consecutive thinking, which is alone worthy of the name, and this is not so commonly met with.

What I insist upon on this occasion is, that so far as the pursuits of Agriculture are concerned, your own minds may be safely introduced to your own bodies, and that relations of friendship and mutual intercourse may profitably be established and grow up between them; that there is no

Digitized by Google

original necessity of having all the living energies of one person expended upon his brain, in producing the power of thought, and all those of another upon his muscle, in developing that of labor; that the acquisition of knowledge, and the power of thinking growing out of it, although a lofty and a mighty power, are, to a reasonable extent, within the reach of every cultivator of the soil; and that as far as they are so, we should account neither duty performed, nor destiny accomplished, until their attainment.

In all other pursuits and callings, a special education is conceded to be necessary. You educate your sons to be lawyers, clergymen, physicians; to be merchants, mechanics and teachers; but to be farmers, you are too apt to leave them to themselves; to allow them to come up untutored, untrimmed, unattended to—as their own farms, if they ever have any, will be very likely to be in consequence of it.

There was a period in the history of Agriculture in this State, there is one in the history of Agriculture in all new States, where this ignorance is excusable. That is the period of early settlement; when there is an excess of land and a scarcity of men; where a continent with its fresh and virgin soil lies all around, and there is hardly found a man to till the ground. At that period and long subsequently, labor is more expensive than land, and the farmer finds it more advantageous to use up fresh acres, than to hire laborers, or even to buy manure to renovate those already exhausted. This is the era of large farms and of small crops; where the number of acres and the quantity of their products bear to each other an inverse ratio.

But this period will and must pass away. It is to Agriculture its dark age, its barbarous era, and, therefore, in the nature of things must terminate. Men multiply, but not the virgin soil. Laborers increase in number, and by their competition reduce the price of labor; but the land is limited, God having circumscribed it by his rivers and lakes; his seas and oceans. Virginity will not last always, and men must sooner or later awake to the fact, that they must learn to increase the quantity, or improve the quality, of their crops upon the same soil, or cease to multiply themselves.

It is true they are slow to learn this, and I am fearful still slower to act upon it. They will suffer, and suffer on, before they will ask of science to lend them its aid to enable them to increase the productions of their soil. Your children, when grown up, have left your homes desolate, and tracked their way to the west. Do you know the reason? They have reflected, and found, if they remained, that penury and want awaited them. They must have a higher grade of agricultural knowledge to employ profitably, labor and manure, or additional acres to use up in their place. You have not given them the first, and they must find the last for themselves. It is

Digitized by Google

true, and proper to add, that this is by no means the only cause of emigration. That activity, enterprise, ambition, and even the spirit of adventure have all had their share in producing it.

In all matters of education, three things are to be considered. *First*, the thing to be educated; *second*, the purpose or object, the calling, pursuit or business, in reference to which the education is to be bestowed; and *third*, the means and instrumentalities through which its bestowment is the most likely to be accomplished. Of these in their order, and

First, the thing to be educated. And that is no less than the human mind,—that aggregate of powers, both of thinking and of feeling, which every sane man, to some extent, possesses. I love the human mind. I love it for its undying wants; for its strong yearnings after future good; for its earnest strivings for perfection; for its deep and abiding affections; for its warm and glowing feelings; for its strict sense of right; for its silent but deep emotions; and for its far-reaching thought, that revels amid its own great and glorious creations. It is the gift of a God, and every way worthy its giver. I love to see the rights of the human mind respected, its right to freedom of research, to freedom of communication, to a free interchange of thought, in a word, to enter into all the enjoyments which God has kindly placed within the grasp of its faculties.

A broad system of culture embraces as well man's moral as his intellectual powers. It is, however, to the latter, only, that the remarks I propose here to make, have any application.

The intellect of the agricultural community, taken as a class, possesses some peculiarities which are worthy of notice. These may arise somewhat, from the nature of the occupation itself. The mind of our farming population, as a general fact, is eminently conservative. It clings to experience, and feels a want of safety in the slightest departure from it. Hence the difficulty that occurs, and the obstacles that are presented, to the introduction, among the great mass of farmers, of new ideas, new instruments, and new methods of cultivation. They are slow of introduction, but when once adopted, and forming a part of their experience, if found useful, they are never abandoned, unless for others that are clearly preferable. If there is, in any class of our people, a home for conservative principles, it is among our farming population.

Another feature that characterises the farmers' intellect, is the slowness of its movements. It has not the elements of activity that are required in the practice of the professions, or that are found in the workshop of the mechanic. Its outward relations and associations are all of a character to give it slowness. Its chief converse is held with the works and processes

Digitized by Google

of nature around it, and these are all slow, regular and certain. If a year is required to mature his crops, why should his thoughts borrow wings from the lightning to accelerate their flight? Their slowness is in harmony with the developments of nature, and the works of God, that are brought immediately within his view.

These two characteristics constitute a strong safeguard to the farmer's mind; and all the more certain and reliable, because derived from its very nature. All innovations and novelties meet with but a cold reception. It is an extremely difficult mind to hoax or humbug; or should success attend an effort of that kind, it would be so long in discovering it, that in the mean time it may have slid from other memories.

Another great fact, rather, perhaps, a feature, than a peculiarity to be noticed, is that a strong common sense, that is, a correct sense of common things, appears to underlay all the movements of the agricultural mind. This is truly invaluable as a foundation upon which to erect enduring structures. It enters into, and essentially modifies, all the intellectual faculties, appearing by far the most prominently in the results of their action.

The agricultural mind, therefore, is possessed of more power than capacity for its ready exhibition; and is endowed with greater strength than activity. Even in the lower walks of life, it has a certain species of strength and like Dobbin's horse, can draw any thing but an inference—and even that, it may be able to draw in matters of politics, morals and religion, for farmers generally, as I believe, are more at home in those subjects than in Scientific Agriculture.

If I am right in these delineations of mind, it is clear that the agricultural intellect presents a soil extremely well fitted to receive and nourish the seeds, not perhaps of a refined, but certainly of a substantial culture. It may not produce so readily the lily and the rose, but might the corn and the wheat in great abundance.

The SECOND general branch of inquiry proposed, was the purpose or object, the calling, pursuit, or business, in reference to which the education is to be conducted. All education, and all improvement in any thing, must be in reference to some purpose. You would never seek to improve a plow, without first making yourself acquainted with its present state and condition, and also with the purpose for which it was used; and your improvement would have reference to both these things.

What then is Agriculture, what its pursuits, what the demands it makes upon the agriculturist, what the matters and things involved in its successful prosecution? These are all topics legitimately involved in this branch of the subject, but they are too numerous and too extended for discussion

Digitized by Google

here. The two main questions that are everywhere presented to the farmer are those: *First*, what are the kinds of produce, whether in crops or live stock, he is required to raise; and *second*, how he can best raise them, in the largest quantity, with the least amount of capital and labor, and on the smallest quantity of land. The first looks to the supply of man's physical wants, and the markets where that supply is furnished. The second regards all the knowledge of the principles and mode of culture involved in the practice of this art.

So far as the first is concerned, the farmer need not trouble himself. By means of roads, railroads, canals and other water communications, every farm in the Empire State now is, or may easily be, brought into direct relations with Boston and New-York, the two great commercial emporiums at the east and south. Here, and through these, the home population alone furnish a constant demand, and thus create an unfailing market for all staple farming productions; while, at the same time, he may be ready to avail himself of the larger chances which the foreign markets may occasionally offer him.

It is at home, in increasing the value and productiveness of his own farm, that the farmer must task his mind to acquire and think, as well as his body to labor. His farm is the instrument of his success or failure, and on his good or bad management of it as such, depends the one or the other. There is no profession or calling that, for the last half century, has made more numerous, or more important requisitions upon science, than that of Agriculture. In every step of its progress it has leaned upon the arm of science, and that arm has been found all sufficient for its support. It has inquired of Geology what are the rocky structures that underlie the soil, because from the decomposition of these, with the exception of occasional drifts, the soil is derived. It has asked of Hydraulics the laws of fluids in motion, with a view to its practice of irrigation and drainage. To Botany, Animal and Vegetable physiology, and Natural History it stands indebted for an exposition of the laws of life, and the peculiarities of development in the animal and vegetable kingdoms. It has required of Meteorology the knowledge of atmospheric phenomena, more especially in their relations to heat and moisture. It has applied to Chemistry for an acquaintance with elementary substances, and that great and eminently useful science has gone into the laboratory, and analysed for its benefit the soil, the plant and the animal. It has verified theory by practice, and thus established on a permanent basis the truth of things.

The first great problem presented by Agriculture to science for solution, regards the effect of organic action upon the substances presented to it, in

Digitized by Google

reference to the growth or continuance of the organism. I say *first* and *great*, because it underlies every other, and on its solution depends the direction which all subsequent inquiries must take.

The human body, for instance, is an organism, whose various structures of bone and muscle, and adipose or fatty matter, are built up and sustained under the influence of organic action, based upon organic laws. These structures chemistry analyzes, and acquaints us with their elements, or last analytical results. Whence are these derived? Their immediate derivation is from organic action, but what is the special agency or power exerted by that action? In the answer to this question lies the solution of the problem; and the answer to it is, that organic action, wherever exerted, whether in the animal or vegetable, can neither change nor create any new elementary substance; that its entire power is expended when it has decomposed, selected and applied, the elementary substances presented to it.

What follows from this truth, once established? It results that neither animals nor vegetables can be nourished or sustained upon all kinds of food indifferently. That the food furnished must contain, within itself, all the elementary substances which enter into, and form the structures, of the animal or vegetable. That when animals feed on animals, they there find bone and muscle and adipose matter. When they feed on vegetables they must derive from them the elements from which these are formed. The vegetable forms a connecting link between the animal and the soil. Taken all together, they must possess the same elementary substances that are found to compose the structures of the animal, because from them these structures are reared up and sustained.

You are raising oxen or horses for the plow, and fattening live stock for the market. You desire to know what will give to the one strength and power of muscle, and to the other additional adipose matter. You have two questions to ask of chemistry, and one thing to do.

You must ask and obtain from the chemist the elementary substances that compose muscle, and adipose matter. He must also state to you the vegetables in which these substances are more especially contained. All that then remains, is for you to furnish them judiciously and in proper proportions. The result will as certainly, and as necessarily follow, as that the sun performs the circuit of the heavens. Here then is one great point in which Agriculture derives aid from science.

But how came you by the vegetable? You certainly never created it. You obtained it, as you obtain all others, from the soil. And do all soils produce alike, in quantity and quality, all vegetable productions? And if not, what is the reason of the difference? We here land upon precisely

Digitized by Google

the same principle we have been considering. All vegetable structures are resolvable into certain original elements. These must be obtained, and whence? No organic action in the vegetable can create them. They must be derived from other bodies. The root must seek them in the earth and the part above the soil must ask them of the air, the shower and the sun light.

This brings us to another important topic, viz: the relations of the plant to the soil in which it grows. Experience alone, long since demonstrated the fact, that the same field, when left to itself, was incapable of producing for successive seasons, in similar quantities, the same species of crop. Hence the practice of rotation in crops may have been due to the suggestions of experience, and not to the teachings of science. But why do you rotate,? It is science alone that can reveal the reason, and instruct you how to do it. You rotate, because the crop you raise, stands debtor for its existence to certain elementary substances derived from the soil on which it grew. These substances, whether organic or inorganic, exist there in but limited quantities. The crop has diminished, or perhaps exhausted, one or more of these substances. Were it suffered to remain there and decompose, those substances would be again returned to the soil, and with them all the additions derived from the air, shower and sunshine. But you take it off and sell it, and then you require of the soil precisely what Pharaoh required of the Israelites, to give you the product, without your furnishing the material. It will not do it—it will go over the Red Sea first.

Experience then has taught you that, another season, you must plant on that soil a different crop. It has done well. But has it also taught you what kind of crop to plant there? How are you to know but what the crop you plant there may require, for perfecting it, a still greater quantity of the already diminished, or entirely lacking element, than that which preceded it? Experience then has taught you the general fact, that it is necessary to rotate crops; but, without the aid of science, it would be long in teaching you in what manner to rotate the most successfully. It is science, that analyzes the soil, and discloses the elements, both organic and inorganic, that are contained in it. It is science that analyzes the plant, and discloses the same thing. Having these two classes of facts furnished, what remains is perfectly obvious, viz: to supply the soil, and to keep it supplied, with all those elementary substances which the ongrowing crop requires to perfect it.

And how is this to be done? It is accomplished through the agency of manures, both of the organic and inorganic kind. You apply these to the

Digitized by Google

soil, and they restore the deficient or lacking element. But these are of many different kinds, and how are you to select that which contains in superabundance the desired element?

Your appeal is again made to science. You ask the chemist to analyze your soil, and from his results you learn the lacking element. You also ask him to analyze manures. He does so, and informs you of the kind in which that element is contained. You have then only to supply it, and your crop is perfect.

The subject of manures then becomes the most important to be investigated in connection with the qualities of the soil on which they are to be used. It is true, as many manures, especially those of the organic kind, always add some new element, they can rarely, if ever, be used amiss; but the certain supply of the precise element required, can only be obtained through the revelations of science. And these are ever adequate for the purpose.

Look, for one moment, at some of the possibilities which science has placed within the reach of Agriculture. It is possible for you, in most cases, by means of different methods of irrigation and drainage, to place your lands in such relations with the sun, the atmosphere, and descending rain, as to secure the requisite degree of heat, dryness and moisture. It is possible for you, by applying the right kind of manures, to increase, to an indefinite extent, the quantity of staple productions which will always find a ready market.

It is possible for you to find, or furnish, a soil with those original elementary substances, which, mounting up through the organization of the vegetable, enter into the organism of the animal; and there, in the proportions you may desire, go to form additions to the bony skeleton for strength and endurance, or to add size and power to the muscle for labor; or give increased quantity to the adipose matter for the market. It is possible for you, by the same means, to add richness to the milk of the cow, or to dilute it plentifully with water previously, as well as subsequently, to the milking.

The third general topic relates to the means and instrumentalities through which the mind of the farmer may be educated, or instructed in the science, and rendered practically acquainted with the art of Agriculture. In the brief enumeration of these, I shall confine myself to those only which are strictly agricultural.

The first that may be mentioned consists in the knowledge and practical skill that may be acquired from witnessing the actual management of a farm, conducted according to the most approved principles and methods at

Digitized by Google

present known. The extent of this knowledge will depend entirely upon the progress, at the time made, in agricultural science and art. It is limited wholly to the lessons of experience, and, in strictness, embraces nothing of the future. Hence it can hardly be styled an element of progress.

The second may be summed up in the thinking mind, the talking tongue, and the listening ear. It embraces all agricultural debates and discussions; and all lectures delivered on subjects of scientific and practical Agriculture. All these are in an eminent degree useful. They excite, although they may not satisfy inquiry. The seeds of knowledge, by means of them, may be extensively sown. Knowledge is the precursor of thought. The mind, by its very action, may, for the first time, discover that it possesses the power to act. Many a dormant energy may be aroused, that might otherwise have remained in time-lasting repose. Let these occasions, therefore, be multiplied—let lectures be far more common, and meetings for debate and discussion become more and more frequent, all the land over. They will tend every where to stimulate inquiry, and to induce a resort to other and more perfect means of obtaining knowledge. They will send the younger minds, for information, to books and periodicals; and thus be instrumental in bringing their contents to the ear of the hearer, as well as the eye of the reader.

A third very efficient means for advancing agricultural knowledge, is found in the organization of the State, and in all the principal counties, the county agricultural society. These associations are entirely voluntary, and hence their principal value. It is one main feature of the present age, that the cause of human progress is eminently subserved and advanced by the great and increasing number and variety of voluntary associations.

These Agricultural Societies keep up a constant organization. They serve as so many rallying points, so many centers of influence. They concentrate all individual effort for agricultural purposes. They are great collectors and disbursers of facts and principles. They are so many heads for the main agricultural body. The county societies are local organizations. They limit their operations to the county, and confine their superintendence to its affairs. The State organization takes a wider range, and embraces within its extended sphere, all the complicated agricultural interests of the State.

In and through the instrumentality of these, lectures may be delivered; agricultural debates and discussions originated and carried on; an immense amount of knowledge, both of facts and principles, disseminated; and great measures, having express reference to all the elements of agricultural progress, discussed, adopted and enforced. If these could be still further ex-

Digitized by Google

tended, and town societies be organized for the same general purpose, they would be productive of great and increasing good results.

A fourth means is, in truth, a measure, for which we are indebted to the voluntary social organizations just referred to, but which is of sufficient importance to have our attention specially directed to it. I allude to our county and State Cattle Shows and agricultural Fairs, with which our industrial history is rendering us so familar. These, especially the State, are producing an incalculable amount of good. They are the jubilees of Agriculture. Here it is that it lights up its council fires, and presents its grand results. Here we all meet upon common ground. Here almost every neighborhood in the State, can find its representative. We have come from the plain and the hill-top; from the mountain's slope and the river's margin. We can see here the productions of almost every variety of soil, from the river's rich alluvion, through the productive limestone, down almost to the "herbless granite." We are here to see, to hear, to learn. We are here to take "sweet counsel together," to unfold to each other our views; to interchange our ideas; to propose, discuss, and adopt our plans and measures. We can ask of the past its lessons of wisdom; of the present its prospects; of the future its hopes. By our proffered rewards, we have excited the spirit of emulation in every part of the State. This has secured the most untiring efforts, guided by the best lights which experience, and the teachings of science thus far, have it in their power to offer. Their rich and varied results are lying all around us. There is one other feature to add, or rather to render more prominent, for the addition has already been made—and that is, to make this great Annual Fair a market, as well as a show; to have it understood universally, that here the choicest vegetable productions, and the best qualities of live stock, can be obtained on the most reasonable terms. Here a system of mutual exchanges might be carried on, which would not only benefit the parties, but would also prove advantageous to the neighborhoods in which they reside.

A fifth means to which our attention should be directed, consists in the publication of books and periodicals upon agricultural subjects. These are to furnish food for the higher orders of agricultural mind. In them are to be found both the results of experience, and the teachings of science in its relations with Agriculture. These books and periodicals present the highest and the purest sources of knowledge now accessible to the mind of the farmer.

It is unfortunate that among many, there exists a prejudice against book knowledge, and even methods of farming derived from books. This is one of the legitimate results of ignorance, and will disappear with the greater

Digitized by Google

diffusion of knowledge. It is now fast wearing away, and will certainly cease with the present generation. It must be apparent to every discerning mind, that the car of scientific Agriculture is destined soon to pass all over our land; and that all who do not voluntarily fall into it, must of necessity fall under it. It will carry, or crush, all within its reach. It will soon plainly appear that all who neglect applying to this source of knowledge, and omit availing themselves of the new and better methods of conducting agricultural pursuits, must fall back into a by-gone age. There is no such thing in this world as really standing still. It is a world of progress, and all, who are not moving onward, are relatively moving backward.

All these sources of knowledge, and means of education, to which I have referred, are now accessible, and actually enjoyed. But are they all which, in the nature of things, can be furnished? There is yet one thing lacking, and I had almost said it was of greater importance than all the rest. I allude to an Agricultural College, directly connected with an experimental or model farm.

What, I will ask, would be the effect, were all our collegiate institutions, our highest seminaries of learning, to be at once stricken from existence, leaving only the lesser lights furnished by the academies and common schools? It would be to dwarf the intellect to at least one half, if not to a fourth, of its present proportions. In such a case, the intellectual world would very much resemble the physical, were the sun erased from the heavens. The greater and higher sources of knowledge would be swept away. We should be no longer refreshed by the outgushings of those noble fountains, whose larger streams, by means of the academies and common schools, become divided and subdivided, until they reach and fertilize every portion of the otherwise arid waste of mind.

This imaginary lack in the intellectual world, now is, and ever has been, a constant, pressing, unfailing want in the agricultural. Did we once possess such an institution, rightly organized, we would no more dispense with it than with the light of yonder luminary.

The establishment of such an institution, upon a right foundation, is seriously and earnestly demanded by every consideration that can address itself to a human mind. It should be so organized as to be adapted to the wants it is designed to satisfy. It should supply to those sciences that lend their aid to the pursuits of Agriculture, higher means of instruction than any now afforded; Natural History and natural science, so much neglected in our common systems of education, should be there fully taught and studied. These sciences, and others of a kindred character, that are capable of uniting and shedding their blended light over the immense domain of

Digitized by Google

Agriculture, should lack nothing of the means necessary to their successful prosecution. The best and the amplest opportunities should be afforded to learn the laws of life, and their agency in giving forms to different living developments; the principles of Meteorology, so far as they have a bearing upon heat and moisture; those of Geology, so far as to acquire a practical acquaintance with the different rocky structures, the order of their succession, and the agents that act upon them; and above all, to become acquainted with Chemical analysis, so far as it can apply to the different soils, and to vegetable and animal structures.

Immediately connected with the institution in which these branches of science are taught, should be a large experimental or model farm. The labor required on this should be performed exclusively by the students. The whole should be so arranged as to mingle in due proportions, the labors of the field with the studies of the college. In this manner, not only would your sons acquire a practical knowledge of the very best methods of Agriculture, and the grounds and reasons upon which they rested, but they would also be at the same time acquiring well developed brains, good digesting stomachs, strong muscles, and powerful frames that might be century lasting. They would be fitting themselves to present that great desideratum, so much desired and so seldom witnessed in perfection, a sound mind in a sound body.

And then with all these acquisitions, where would they go? What would become of them? They have left your homes and your fire-sides. Your sons leave you now, but like the dove of Noah, they return not unto you again. You look for them after a little, and find them scattered over the western prairies or in the thronged city. You may seek for them in the counting room, at the bar, or in the pulpit, any where in fine except on the spot where their infancy was reared.

But those who spend their term at this college will return unto you again. Yes, they will return to instruct you in the loftier teachings to which they have been listening. They will return to tell you, that in the successful prosecution of agricultural pursuits, science is as necessary as acres, and that in them there is work for the brain as well as for the muscle. They will return to enoble and exalt agricultural life, and to infuse into it new elements. They will return to introduce new and improved methods of farming; to reduce to actual practice the new thoughts and ideas they have acquired; to become themselves the sources of light and knowledge to their own, and surrounding neighborhoods. They will return to carry through life the undying thought; the never to be forgotten recol-

Digitized by Google

lection, that you have contributed to give them minds to think as well as bodies to labor.

Nor would the immense advantages of such an institution by any means stop here. It would be a great central source of light and knowledge. There your different varieties of soil could be analyzed; there your annual fairs could, if desirable, be held; there would be the great rallying point of Agriculture; every year would be sent forth its young men, its living epistles, to be known and read of all men. Its various teachings would find their way into the printed volume, and thus furnish food everywhere for the higher orders of intellect; they would be caught up by the periodical, and sent by steam and stage to the dwelling of every farmer who is accustomed to read and reflect; they would be seized upon by the debater and lecturer, and poured into thousands of minds, to whose intellectual vision the volume of wisdom is closed, and to whom the periodical comes not with its rich treasures of knowledge and thought.

Suppose all these educational means actively employed, and in the most successful operation; need I stay to point out to you their great and glorious results? I will not detain you by referring to the improved appearance of your farms; to the new aspects everywhere thrown over the face of physical nature; to the greatly increased productiveness of your soils; to the new springs of energy and enterprise which that productiveness would unseal. These must be obvious to every reflecting mind. But there are results of a different character, in full view of which I cannot remain silent. I allude to the effects that would be produced upon the agricultural mind of the present and the rising generation.

That mind would soon learn to throw off its slowness and sluggishness of action. It would be found awakening to a sense of its own powers of knowing and of thinking. It would be found originating searching inquiries into the nature of the things around it. Fortunately, the very occupations of Agriculture furnish it with subjects for its constant exercise. It need not learn the language in which Virgil sang, or that in which Demosthenes thundered, while the voices of living nature are ever around it. Neither need it necessarily limit its investigations to things that are merely physical; to the lower wants; or to the first or original purposes which things subserve.

The gross material of the universe about us, admits of application here to different purposes. Nothing is ever destroyed, or perishes in its first use. All the energy of human power is as utterly incompetent to effect the destruction of the minutest atom, as of the mightiest mass of matter. It may change the form under which it appears. Solids may be trans-

Digitized by Google

formed into fluids, and fluids into gases. Through the agency of heat, we can cause water to disappear, but the floating vapor proclaims its re-appearance in another form. God only can destroy, because He only can create.

The application of the things about us to the lower wants, never exhausts their entire capacity. From the beaming star down to the humble glow worm, all material objects, together with their physical relations, are susceptible of administering to lower or higher purposes. The first are entirely subservient to physical wants; the last to those of the ideal, the moral, the benevolent, the religious. In virtue of the first, physical objects, possessing exchangeable value, may be appropriated, and become the special property of some one, to the exclusion of the right of every other. In virtue of the last, they are incapable of such appropriation, but always remain the property of the delighted sense and the gratified faculty. We may, for example, appropriate the land, but not the landscape. We may cage the bird, but not its music. We may own the flower, but not its aroma. Of the one, we may be the absolute and unconditional owner. Of the other, we can enjoy a property in common only with others of the race. Every thing around us, is thus addressing our higher powers and natures in a loftier language than that designed for our mere physical wants. It is for the mind, it is for all minds to learn this language, and thus ascend into the higher walks of thought.

One obvious result of all this, will be to elevate and exalt the pursuits of Agriculture. The farmer will no longer be looked upon by any one, however prejudiced or contracted in ideas, to be as mindless as the clod he cultivates; his labor will be dignified, because it will be directed by his own thought. It will be regarded as the exponent of his own mental operations. If at the South, labor is to be forever servile and degraded, let the world see, that at the north, east and west, it is not only to be free, but is also to have a free element to dwell in—the element of thought.

Another obviously beneficial result will be, that thought will come up untrammeled, that all obstacles will be removed, and every aid and encouragement given to the exercise of its infant energies; that wherever genius, or the power of thought is born, there it may be nourished and brought to maturity.

We in truth now, and much less shall we then, little know where sleeps the head to which mankind may be the most extensively indebted. It may be pillowed in poverty, want and destitution may be the inmates of its dwelling; the coldness of neglect, or the smile of derision, its encouragement to effort. It goes forth alone and unnoticed. The man of business, and of pleasure, and of politics, passes by regardlessly. He has no eye to

Digitized by Google

see, no ear to hear, or tongue to encourage. Nor are these required. Their place is more than supplied by the ten thousand glorious influences that come up fresh and invigorating from every part of this vast temple, the Universe, where God is worshiped. These sustain and support with a power more than human. And with their kindly aid, it pursues onward its noiseless and unobtrusive course, until—the first intelligence we have of it, it sends up its pointed rod to protect our dwellings from the thunderbolt, or pushes afloat its steam ship to gladden our waters, or quietly stretches from post to post its electric wire, until presently the two extremes of a continent are conversing with each other. A single invention, or the discovery of the simplest principle, may be of infinitely more value to man, than the creation or dismemberment of an hundred empires. Take, for instance, the principle of representation in Government. Would all the wealth, and power, and influence of the world combined, purchase of you that principle? No. Because without it, all that wealth, power and influence, would be divested of value. Without it, they might indeed be roses, but they would be roses growing upon a grave, and utterly valueless to the unconscious dust beneath them.

And thus it has been ever. Centuries since, while the Tartar Tamerlane was desolating the Eastern world, and piling up his pyramid of ninety thousand human heads on the ruins of Bagdad, an eye that was sweeping over the world, might have seen wandering over the fields of Mentz, a little boy, whose fame should eclipse that of twenty Tamerlanes; for where shall we find a place for the bloody butcher by the side of the author of the Printing Press? The Tartar has long since gone to his final account; even his pyramid of human heads, has mingled with its kindred dust, but the moveable Types of Johannes Faust, are but yet in the spring time of their mission, and to them even the very name of Tamerlane is indebted for its frightful immortality.

Farmers of New-York:—My concluding remarks must be addressed to you. You are now standing in the middle of the nineteenth century. It is one of revolutions and of revelations. It was ushered in by the booming cannon of Napoleon. It has travelled thus far over tottering thrones and decaying dynasties. Its mission to man must be great and glorious, but it is as yet only half accomplished. To the inhabitants of the old world it comes in the forms of revolution; awaking them to a sense of their political rights; to those of the new, in the forms of revelation; awaking the mind of the laborer to a sense of its right to be educated, thus adding dignity to labor, by uniting it with intelligence. It is saying here to the toiling millions move on—ye have yet a problem to solve, yet a destiny to

Digitized by Google

fulfil. Ye have thus far in the world's history had both capital and mind to contend with. Add mind to yourselves, and ye will then have secured the lever that moves the world. Ye will then have nothing to fear, but every thing to expect, from capital.

On this great theatre of action are you alone to remain idle? Numerically you compose about three-fourths of the population of the State. Your property pays a large proportion of the State taxes. Your votes elect the great majority of the State Legislature, and your moral influence should control them in their action. You desire the establishment of an Agricultural College, with other means and facilities for improvement in the science and art of Agriculture? You have only to speak and it is done. And will you do it?

If you can gather up no sufficient motives to do this from your own experiences, if you are unable to derive them from the tombs of your fathers, go I entreat you to the cradles of your infants. Ask of them the lessons which your tombs deny you. Go to your sons and daughters just blooming up into manhood and womanhood. Go to the young. The YOUNG—and what soul-stirring associations cluster around that term. The YOUNG—to whom the language of the cradle and the lessons of the tomb, are equally accessible. The YOUNG—the rising hope of earth, for whose benefit man has been toiling on ever since the creation, and now presents the accumulated experience of nearly six thousand years to admonish, to warn, and to guide. The YOUNG—whom posterity are to hold responsible for the proper performance of high and holy trusts; trusts increasing in magnitude and importance as the experience of the world accumulates its lessons. The YOUNG—who are just now stepping upon life's thronged arena, on whom the chains of habit have never yet been riveted, whose course and destiny depend so essentially, so almost entirely upon themselves. Oh that we might redeem, that we might save, that we might enlighten, that we might enoble the YOUNG, is the language, both of age and of infancy, the cry that bursts forth spontaneously from the tomb and from the cradle. You may heed it if you will, and thus leave them a far richer legacy than you have yourselves inherited—a legacy of which ordinary misfortunes cannot deprive them, which reverses cannot destroy; and to which time, as it runs its successive cycles, only gives a constantly increasing value.

Digitized by Google

New-York State Agricultural Society.

REPORTS OF COMMITTEES, 1850.

CATTLE.

Class A. SHORT HORNS. BULLS.

Judges.—D. C. Collins, Conn., chairman; Horace Capron, Laurel Factory, Maryland; Uriah Orvis, Massena, N. Y.

Over three years old.—Extra stock—Sherwood & Stevens, Auburn, certificate for (third Duke of Cambridge, imported, bred by Thomas Bates, Kirkleavington, England,) who received 1st premium in 1849. 3. J. D. Thorpe, Albany, (Damon,) $5.

Two years old.—1. Sherwood & Stevens, Auburn, (Earl Seham, imported, bred by Mr. Stephenson,) $20. 2. S. P. Chapman, Clockville, (Fortune,) $10. 3. Geo. Vail, Troy, (Eclipse,) $5.

One year old.—2. Lorillard Spencer, (Woldsman.) Williams Bridge, $10.

Calves.—1. J. M. Sherwood, Auburn, (Vane Tempest, imported, bred by Mr. Stephenson,) $10. 2. Francis M. Rotch, Butternuts, (Prophet,) Trans. and $3.

The committee remark, that any animal to be entitled to the premiums of the Society, (especially the first premium,) should have *decided merit*, and while well aware that such animals exist among the breeders of this great State, the committee had no animals presented for their examination of sufficient excellence to enable them conscientiously to award the premiums which have been omitted.

SHORT HORNS. COWS.

Judges.—Henry Parsons, Guelph, C. W., chairman; Paoli Lathrop, South Hadley, Mass.; George W. Dobbin, Baltimore, Md.; Col. Stone, Mass.

Over three years old.—Extra stock, S. P. Chapman, Clockville, certificate for (Charlotte, bred by E. P. Prentice, Mt. Hope.)

COWS—*Over three years old.*—1. George Vail, Troy, (Esterville, bred by E. P. Prentice, Mt. Hope,) $25. 2. Col. D. D. Campbell, Rotterdam, (Rosa,) $15. 3. Thomas Hillhouse, Watervliet, (Daisy,) $5.

HEIFERS—*Two years old.*—1. Ambrose Stevens, New-York, (Princess, 2d, imported, bred by Mr. Stephenson,) $20.—2. George Vail, Troy, (Hilpa 2d, bred by Mr. Vail,) $10. 3. George Vail, Troy, (Eunice 4th,) $5.

Digitized by Google

One year old.—George Vail, Troy, (Lady Barrington 5th, bred by Mr. Vail,) $15. 2. S. P. Chapman, Clockville, (Duchess,) $10. 3. F. M. Rotch, Butternuts, $5.

Calves.—1. George Vail, Troy, (Hilpa 3d, bred by Mr. Vail,) $10. 2. J. M. Sherwood, Auburn, (Petunia,) $3, and Trans.

The committee would express the high gratification they have enjoyed in witnessing so many highly creditable animals, and regret that they have not more premiums to bestow upon them.

DEVONS.

Judges.—Francis Rotch, Butternuts, chairman; John W. Proctor, Danvers, Mass.; Henry Whitney, New Haven, Conn.

BULLS—*Over three years old.*—1. R. H. Van Rensselaer, Butternuts, (Major,) $25. 2. John Muir, sen., Hamilton, $15. 3. Arden Woodruff, Wyoming, $5.

Two years old.—1. John Freemyre, Schoharie co., $20. 3. H. N. Washbon, Butternuts, $5.

One year old —1. H. N. Washbon, Butternuts, $15. 2. Leroy Mowry, Washington co., $10. 3. Lewis G. Collins, Dutchess co., $5.

Calves.—1. Lewis G. Collins, Dutchess co., $10. 2. H N. Washbon, Butternuts, $3, and Trans.

COWS—*Over three years old.*—1. H. N. Washbon, Butternuts, $25. 2. Lewis G. Collins, Dutchess co., $15. 3. E. P. Beck, Sheldon, Wyoming co., $5,

HEIFERS—*Two years old.*—1. E. P. Beck, Wyoming co., $20. 2. H. N. Washbon, Butternuts, $10. 3. M. C. Remington, Cayuga co., $5.

One year old.—1. Leroy Mowry, Greenwich, Washington co., (bred by A. Stevens,) $15. 2. Lewis G. Collins, Dutchess co., $10. 3. H. N. Washbon, Butternuts, $5.

Calves.—1. E. P. Beck, Sheldon, Wyoming co., $10. 2. E. P. Beck, Sheldon, Wyoming co., $3, and Trans.

HEREFORDS.

Judges.—A. T. Dickinson, Whitlockville, N. Y., chairman; J. R. Lawton, West Stockbridge, Mass.; Peter Keese, Keeseville.

BULLS—*Over three years old.*—1. Wm. A. Keese, Peru, Clinton co., (Panic,) $25. 2. E. Corning, jr., Albany, (Young Major,) $15.

One year old —2. Wm. A. Keese, Peru, Clinton co., (Noble,) $10.

Calves —1. E. Corning, jr., Albany, (Prince Albert,) $10.

COWS—*Over three years old.*—E. Corning, jr., Albany, (Victoria,) $25. 2. E. Corning, jr., Albany, (Young Victoria,) $15. 3. Wm. A. Keese, Peru, Clinton co., (Matilda,) $5.

HEIFERS—*Two years old.*—2. Wm. A. Keese, Peru, Clinton co., (Adelaide 4th,) $10.

Calves.—2. Wm. A. Keese, Peru, $3 and Trans.

AYRSHIRES.

Judges.—Adam Fergusson, Woodhill, C. W., chairman; S. A. Law, Meredith, N. Y.; William S. King, Manton, R. I.

BULLS—*Over three years old.*—1. E. P. Prentice, Mt. Hope, (Dandy,) $25.

Calves.—1. E. P. Prentice, Mt. Hope, (Dundee 3d,) $10.

COWS—*Three years old.*—1. E. P. Prentice, (Daisy,) $25. 2. E. P. Prentice, (Mida,) $15.

Digitized by Google

HEIFERS—*Two years old.*—1. J. McD. McIntyre, Albany, (Norma,) $20. 2. E. P. Prentice, Mt. Hope, (Ayr, 4th,) $10.

Calves.—1. E. P. Prentice, (Red Lady,) $10. 2. E. P. Prentice, (Jennie Deans,) $3 and Trans.

NATIVES AND GRADES.

Judges.—William Nicoll, Islip, L. I., chairman; B. McNeil, Carlisle, Scho. co.; Joseph Hastings, Brunswick.

COWS—*Over three years old.*—1. D. H. Albertson, Lima, Liv. co., $20. 2. Thomas Bell, Morrissania, Westchester co., $12. 3. Isaac Sheldon, Sennett, $4.

(Favorable notice of a three year old heifer, exhibited by Thomas Bell, Morrissania—one by Joseph Haswell, Hoosick. Also, three heifers three years old, by John Townsend, Albany.)

HEIFERS—*Two years old.*—1. Thomas Bell, Morrissania, $15. 2. Isaac Sheldon, Sennett, $10. 3. Joseph Haswell, Hoosick, $3.

(Favorable notice of a heifer exhibited by John Townsend, Albany.)

One year old. 1. F. B. Leonard, Rens. co., $10. 2. Joseph Haswell, Hoosick, $8. 3. Thomas Bell, Morrissania, $3.

(Favorable notice of a heifer exhibited by John M. Mott, Lansingburgh.)

Calves.—1. John Lossing, Albany, $3. 2. Milton Knickerbocker, Schodack, Trans.

BULLS.—Very fine specimens of grade bulls and bull calves exhibited, which the committee notice, though they cannot recommend to the Society to award premiums for bulls except of pure blood. A Devon grade bull exhibited by John Cross, of Oneida co., and grade Durham and Devon bull calf, by Silas Sweetland, Clifton Park, Saratoga co., were very good animals.

WORKING OXEN.

Judges.—Harvey Dodge, Sutton, Mass., chairman; H. N. Cary, Marcy; Edward Fitch, Saratoga.

OXEN—*Over four years old.*—Best team from any town, not less than ten yoke, W. Strever, Kinderhook, $25.

Best single yoke, James S. Wadsworth, Geneseo, $20. 2. Elon Sheldon, Sennett, $15. 3. John P. Beekman, Kinderhook, $5.

Secial premiums awarded for single yoke.—R. Mesick, Kinderhook, $5; J. H. B. Church, Vernon, Oneida co., $5; Arden Woodruff, Wyoming, $5; James H. Sherrill, N. Hartford, $5; John Brydon, Westmoreland, $5; Henry B. Bartlett, Paris, $5; Joseph Haswell, Hoosick, $5.

STEERS, THREE YEARS OLD.

Judges.—Lester Filley, Otis, Mass., chairman; Matthew D. Bogert, Clarkson, Rockland co.; George O. Peck, Lenox, Mass.

Best single yoke, John Muir, Sen., Hamilton, Madison co., $10. 2. B. H. Streeter, Clyde, Wayne co., $8. 3. James S. Wadsworth, Geneseo, $3 and Trans.

A premium is recommended to Elon Sheldon, of Sennett, Cayuga co., for a valuable pair of steers, $5.

The steers entered in this class were from the counties of Columbia, Cortland, Chenango, Cayuga, Genesee, Madison, Rensselaer, Otsego and Wayne—all but one pair of those entered were broken to labor. The breeds of cattle were generally mixed, consisting of Devon, Durham, Devon

Digitized by Google

and Durham, Native and Durham. Some of them were exceedingly fine and well made. All of them were good—most well matched and well calculated for the yoke.

STEERS, TWO YEARS OLD.

Judges.—Eldad Post, Lenox, Mass., chairman; Robert Lewis, Mechanicsville; Morgan Lewis, West Stockbridge, Mass.

Best single yoke, S. A. Gilbert, Hamilton, Madison co., $10. 2. B. Benedict, Genesee co., $8. 3. James H. Sherrill, New Hartford, $3, and Trans.

To boys under 16, *training yoke of steers.*—1. John N. Benedict, Alexander, Genesee co., Silver medal. 2. Henry Comstock, Clinton, Oneida co., $3, and Trans.

To S. A. Gilbert, the committee recommend an award of $2, for training steers.

Jas. S. Wadsworth, of Genesco, exhibited a pair of steers, unbroken, which were very heavy, and the committee recommend a premium of $5. Hiram Sheldon, of Sennett, pair of twin steers, special premium of $3. Luther Comstock, Clinton, Oneida co., special premium of $2, for pair of steers.

The committee believe that the exhibition of the beautiful steers in this class, will serve as a stimulus to others to improve their stock, by selecting and rearing their best calves, which form an important link in a chain stronger than iron to move on the car of the State Agricultural Society; for from these are to be formed the working oxen hereafter, to grace the Fairs of the Society.

STEERS, ONE YEAR OLD.

Judges.—John D. Ledyard, jr. Cazenovia, chairman; Gorton T. Thomas, Keeseville; Stephen Batty, Keeseville.

Best single yoke, James H. Sherrill, New Hartford, $8. 2. S. A. Gilbert, Hamilton, Madison co., $5. 3. James D. Van Vechten, Schodack, Rens. co., $3, and Trans.

Discretionary Premiums.—Lewis E. Smith, Half Moon, Vol. Trans.; H. B. Bartlett, Paris, Oneida co., Vol. Trans.

Training steers, boys under 16.—Best, S. A. Gilbert, Hamilton, N. Y., Silver medal. 2. J. H. Sherrill, New Hartford, $3, and Trans.

The competition in this class was very spirited. The committee, in awarding the premiums, had more especial reference to the symmetry and form of the animals, preferring and believing it just to award the premiums to such as were really meritorious, rather than those who were dependent on corn and meal for their good appearance.

MILCH COWS.

Judges.—Gen. Rawson Harmon, Wheatland, chairman; William Carter.

The committee on milch cows, report: That there were six entries in this class; but only one, that of S. P. Chapman, of Clockville, Madison co., which complied with the regulations of the Society. His statement is annexed, and we award him the premium of $20.

"Ruby," the cow for trial, was kept during the experiment on grass, only, and on the same for fifteen days previous to each period of trial.

1. She was five years old the 10th of April last, is a thorough-bred

Digitized by Google

RUBY SHORT HORN COW.

THE PROPERTY OF S. P. CHAPMAN. BRED BY GEORGE VAIL ESQ. OF TROY.

Lith. of Richd H. Pease. Albany

Digitized by Google

Digitized by Google

short-horn, and her time of calving this year, was the 27th of May. 2. The quantity of milk, in weight, on the first trial, from the 10th to the 20th of June, was five hundred and thirty and one-fourth pounds. The quantity of butter made, was twenty pounds and four ounces. [During this trial, one pan of milk was lost by leakage, which would have made at least one-fourth pound more of butter.]

The quantity of milk on the second trial, from the 10th to the 20th of August, was four hundred and seventy-nine and one-fourth pounds. The quantity of butter was nineteen pounds and fourteen ounces.

The whole quantity of milk for the twenty days of trial, was *one thousand nine and one-half pounds*. The whole quantity of butter made was *forty pounds and two ounces*.

The quantity of milk given each day of trial, and the quantity of butter made every *two* days is exhibited in the following table:

1st trial. Milk.	Butter.	2nd trial. Milk.	Butter.
10th June, 52 lbs. 14 oz.	4 lbs. 8 oz.	10th Aug., 45 lbs. 14 oz.	3 lbs. 3 oz.
11th " 54 " 6		11th " 50 " 6	
12th " 50 " 6	3 " 14	12th " 48 " 6	3 " 8
13th " 52 " 14		13th " 49 " 6	
14th " 52 " 14	3 " 13	14th " 45 " 14	4 " 4
15th " 51 " 14		15th " 50 " 14	
16th " 53 " 6	4 " 0	16th " 44 " 14	4 " 12
17th " 52 " 14		17th " 48 " 6	
18th " 52 " 14	4 " 1	18th " 46 " 14	4 " 8
19th " 55 " 14		19th " 48 " 6	

It will be seen by this statement, that on the 16th and 17th of August, she gave 93¼ pounds of milk, which produced 4 lbs. 12 oz. of butter, being one pound of butter to less than 20 lbs. of milk. The weather was *very bad* for making butter during several days of the trials, the thermometer ranging as high as 90° in the shade.

Ruby has given from the 10th of June, to the 20th of August, a period of 71 days, *three thousand five hundred eighty-four and one-fourth pounds of milk*, and on *grass feed only*, with the exception of two bushels of shorts given her about the 1st of July.

The pedigree of this cow is here given: "Ruby"—red and white; bred by George Vail, of Troy, N. Y.; calved 10th of April, 1845; got by Symmetry, 166. [Symmetry, by imported Duke of Wellington, 55, (3654,) out of imported Duchess. Am. Herd Book, p. 172. Both bred by Thomas Bates, Esq., Yorkshire, England,] out of Willey, 111 by Mars. Young Willey by York, Old Willey, imported, &c. *See Am. Herd Book*, "*Young Willey*."

S. P. CHAPMAN,
JULIA M. CHAPMAN.

Sworn and subscribed before me,
August 30th, 1850.

S. Chapman, *Justice of the Peace.*

Mt. Pleasant, Clockville, Madison Co., N. Y., Aug. 26th, 1850.

Fat Cattle, Stall Fed.

Judges.—Thos. F. De Voe, 8 Jefferson Market, New-York, chairman; Gideon Thompson, Bridgeport, Conn.; Thomas Beekman, Columbia county, N. Y.

Digitized by Google

The Judges on Stall-fed Fat Cattle, under the head of "Pairs fat oxen 4 years and over," report:

No. 162. Edward Munson, Sennett, Cayuga co., presented 1 pair of fat cattle, 6 years old last spring, weighed 5,267 pounds, light roan color, very large, and one of them, the smallest sized one is very handsome; had they been fed properly the last year and another year to come, they would have weighed over 6,000 pounds, and been an extraordinary pair of cattle. The smallest framed animal has more Durham blood, more prime parts (in the beef,) better shoulders, flank, and other points to indicate plenty of rough and kidney fat, and a more profitable animal to the butcher. The following will show the manner in which they have been fed:

I present for your consideration one pair of fat oxen, six years old past, supposed to be half blood Durhams; from calves, up to December, 1847, the fall that they were three years old past, they received no extra keeping; during the winter of 1847 and '48, they were stall fed, with a mixture of corn and barley meal, with some few beets from time to time. The summer of 1848 they run to pasture, having no feed but grass; from December, 1848, to September, 1849, they were fed about twelve quarts of meal each per day, ground from corn in the ear, with plenty of hay in winter and grass in summer. From first of September, to middle of November, 1849, their meal was denied them; from November, to the present time, they have received twelve quarts of meal each, per day, ground from corn in the ear, making the whole time of feeding about twenty-three months.

Very respectfully yours,
EDWARD MUNSON.

Sennett, Sept. 3, 1850.

We came to the conclusion they were the best pair of cattle on the ground, and therefore award them the first prize, $25.

No. 177. A. Ross, Preston, Chenango county, one pair of fat cattle, four years and five months old, weighing 4,112½ lbs., a very good weight for their size and appearance, but when closely examined they show that they have been properly dealt with. One of them in particular was a choice animal, not over-fed, but the kind that gets fat on *about half the feed* that would take to keep an *open, coarse made animal.* Their color, red and white, they have been fed through last winter and summer, about four quarts of ground corn and cobs, occasionally a little ground rye, with plenty of good hay and grass. We consider these the second best, and award them the second prize of $15.

No. 11. John H. Boyd, Whitehall, Washington county, one pair of fat cattle, six years old last spring, almost native breeds. A very good fat pair of cattle, a little too much neck, shoulders and shins to be profitable to the feeder, farmer or butcher. They want a close made, active, easy keeper, full in all of the points, (flanks, cod, shoulders, &c.,) rather small head and neck, broad shoulders, hips and rump, and the brisket not very large; for the farmer, when he is this, he is the worker and an easy keeper; for the feeder, he fats easy, weighs heavier, sells quicker, and commands a better price; to the butcher, he has plenty of prime parts, the grain of the meat finer, cuts richer, smaller bone, and the best of all, plenty of inside kidney and rough fat. Most of the cattle of this description that came under the observation of one of the Judges, *were about half Durham*, with the other part "large native," of the place where fattened. They appear to have "done better," as it were, "on their own barn yard," than they would have done had they been strangers. We award to these the 3d prize, $10

Digitized by Google

Digitized by Google

SHORT HORN COW, GRACE, winner of the 1st prize. as the best Fat Cow, at the Show of the New-York State Agricultural Society, at Albany, 1850; property of A. Stevens and J. M. Sherwood. She was killed in New-York in March, 1851. Live weight, 1745 pounds; quarters, 1210 pounds; tallow. 153 pounds; hide, 101 pounds; total dead weight, 1464 pounds.

Digitized by Google

No. 129. Under the head of single oxen over four years; James S. Wadsworth, Geneseo, Livingston co. One fat Durham ox, (or properly a steer,) we hardly think full blood, may be three parts, and one of southern native; his weight 2,247 lbs., five years old last spring, roan color, raised by the Hon. Henry Clay. He is not the largest, but is certainly the finest animal on the grounds; his points are all full, back and hip very broad, almost a straight line from the root of the tail to the tip of the horns, which are also straight and small, legs short and small, and to the *butcher he is almost perfection*; a very choice, prime, fat and well proportioned steer. We take great pleasure in awarding to him the 1st prize, $15.

No. 129. (Again) belonging to the same gentleman. One Durham steer, four years old last spring, weight 2,197 pounds, a very fine deep red; his figure and proportion nearly as good as the former, but not quite so much flesh; points very good and hard. These two are decidedly the finest steers in the Fair, and do Mr. Wadsworth a great deal of credit. We cannot do otherwise than award him the 2d prize, $10.

No. 117. Marion E. Myers, Glenville, Schenectady county. One steer, four years and four months old; good fair beef, but we think not entitled to a prize; another year's "feeding" would improve him.

No. 244. A. Osborne, Watervliet. One ox thirteen years old; very good for his age, but not worthy of a prize.

Sherwood & Stevens, Auburn, N. Y. One fat cow, and an extra one she is too; ten years old; weight 1,765 pounds; she appears to be the improved "short horn;" perfectly white; she has in proportion a great deal more fat than flesh; hips very large and prominent; rather thin on the buttock; excellent points; small in size, but square built; on the whole an extra fine cow, and entitled to the first prize, $15.

No. 324. Aaron Taylor, Alden, Erie county. One stall-fed fat cow, seven years old; weight 1,855 lbs.; large size, but well proportioned; good points; just the kind to keep and fat easy; six months more "feeding" would have made her an extra one for the "knife," and we think entitled to the second prize, $10.

No. 110. Under the head of "single steers four years old or under," Edward Sheldon, Sennett, Cayuga county. One fat steer, not quite four years old; weight 1,880 pounds; he is called a full blood Durham, (he may be three parts,) a great many imported cattle are bought for full bloods, but place some of them side by side, a decided difference is then seen, although the cross may be best for beef, as is often the case. This steer is full in his points, finely made about the shoulder, hip and rump, and altogether a choice steer; his owner says he has had no grain this summer. He is in our opinion entitled to the first prize, $10.

No. 37. Milton Knickerbocker, Schodack, Rens. co. One fat steer, two years five months old, 1,721 pounds, very large growth, rather "coarse and clumsy" on the head, neck and legs, but a well fattened young steer, and deserves the second prize, $6.

Fat Cattle, Grass Fed

Judges.—James Macintyre, Mont. co., chairman; Lewis Sherrill, Greene co.; C. Phillips, Mont. co.; Hiram Slocum, Troy;

Oxen—*Over four years old.*—Best, Elon Sheldon, Sennett, Cayuga co., $20. 2. James H. Sherrill, New Hartford, Oneida co., $12. 3. Hiram Sheldon, Sennett, Cayuga co., $8.

Cows—*Over four years old.*—Best, Luke Putnam, Warsaw, Wyoming.

Digitized by Google

co., $10. 2. George Vail, Troy, $6. 3. G. Lee, Cambridge, Washington co., $4.

FAT STEERS—*Four years or under.*—Best, James S. Wadsworth, Geneseo, Liv. co., $12.

HEIFERS—*Three years old.*—Best, Joseph Haswell, Hoosick, Rens. co., $8. 2. Elon Sheldon, Sennett, Cayuga co., $3.

Some of the Stock in this class was very fine—others not equal to what it should be, and we hope an improvement will be manifest hereafter. Certificates were furnished, that the cattle were fed on grass and hay.

FAT SHEEP.

Judges.—D. D. Warren, Springfield, Mass., chairman; Truman Safford, Saratoga co.; J. C. Mather, Troy.

LONG WOOLED—*Over two years old.*—2. Richard Gypson, Oneida co., $3.

MIDDLE WOOLED—*Over two years old.*—1. J. M. Sherwood, Auburn, N. Y., $5. 2. Z. B. Wakeman, Herkimer, $3. 3. J. McD. McIntyre, Albany, Morrell's Shepherd.

Discretionary premiums recommended.—For middle wooled lamb, Richard Gypson, Oneida co., Trans.

For fat sheep, E. R. Dix, Vernon, Oneida co., Trans.

FOREIGN CATTLE.

Judges.—Lewis F. Allen, Black Rock, chairman; Thomas Bell, Morrissania; D. H. Hatton, Nansemond co., Va.

SHORT HORN BULLS.—1. George Miller, Markham, C. W., $25 and Dip. 2. Paoli Lathrop, South Hadley Falls, Mass., $15.

Both of the above bulls were good, and but a slight difference, taking all their qualities into consideration.

COWS—*Four years old.*—2. George Miller, Markham, C. W., $15.

Bull calf, (6 *months.*)—George Miller, Markham, C. W., Diploma.

DEVON BULLS.—1. Lemuel Hurlbut, Winchester, Conn., on his bull (Bloomfield,) $25 and Dip. 2. W. R. Sanford, Orwell, Vt., $15. 3. Wm. L. Cowles, Farmington, Conn , $5.

Mr. Hurlbut's bull was a very superior specimen of a thorough bred Devon.

Yearling Bull.—1. William L. Cowles, Farmington, Conn., $15.

Bull Calf.—1. Wm. R. Sanford, Orwell, Vt., $10.

COWS.—1. Wm. L. Cowles, Farmington, Conn., $25 and Dip. 2. Lemuel Hurlbut, Winchester, Conn., $15. 3. Wm. L. Cowles, Farmington, Conn., $5.

Yearling Heifer.—1. Wm. L. Cowles, Farmington, Conn., $15.

Heifer Calves.—1. Lemuel Hurlbut, Winchester, Conn., $10. 2. Wm. L. Cowles, Farmington, Conn., Trans.

AYRSHIRE BULLS.—1. Roswell L. Colt, Paterson, N. J., $25 and Dip. 3. E. W. Woodford, Avon, Ct., $5 and Trans.

COWS.—1. R. L. Colt, Paterson, N. J., $25 and Dip.

HEIFER—*Two years old.*—2. R. L. Colt, Paterson, N. J., Dip.

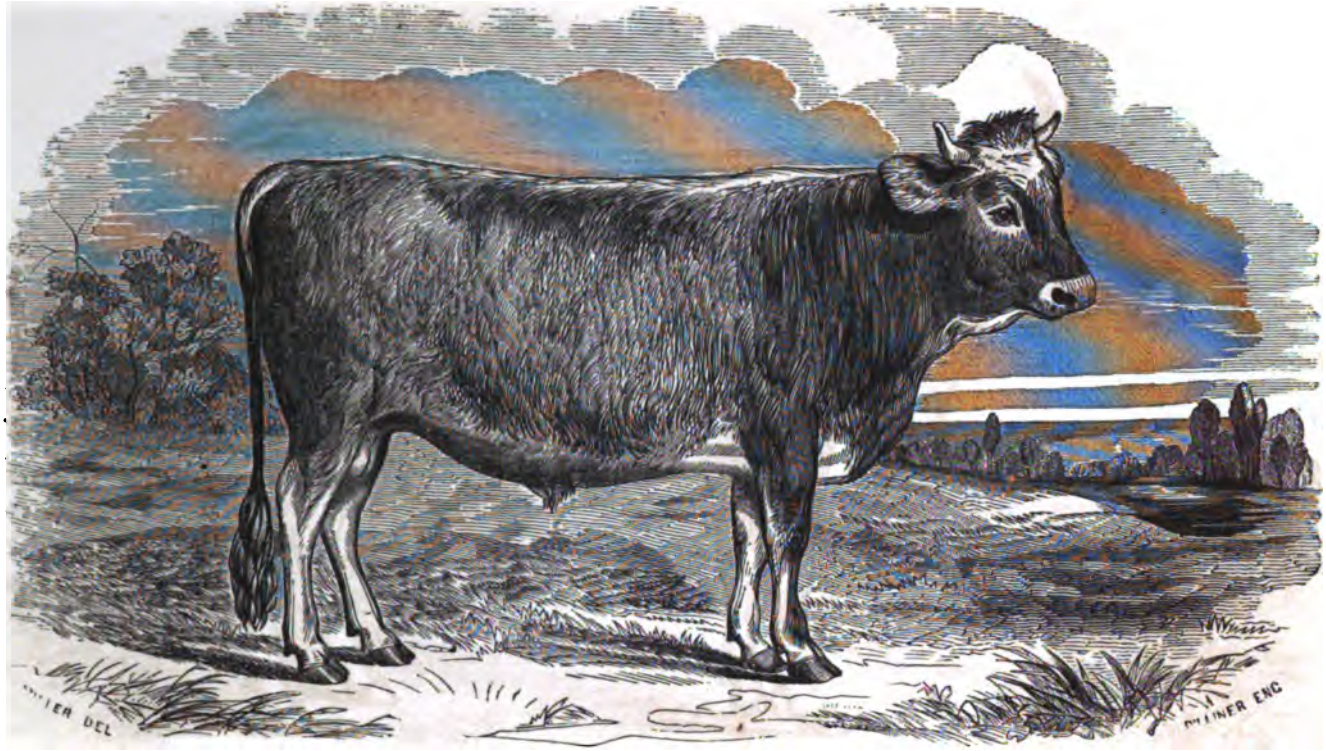
Discretionary—ALDERNY BULL.—1. R. L. Colt, Paterson, N. J., $25 and Dip.

COWS,—1. R. L. Colt, Paterson, N. J., $25 and Dip.

Bull and Heifer Calves.—R. L. Colt, Paterson, N. J., thanks and Dip., for his public spirit in sending them to the exhibition.

Digitized by Google

Digitized by Google



IMPORTED HUNGARIAN BULL, one year old; property of Roswell L. Colt, Patterson, N. J.

Digitized by Google

IMPORTED HUNGARIAN HEIFER, two years old; property of Roswell L. Colt, Patterson, N. J.

Digitized by Google

Digitized by Google

Cross bred, Short Horn and Devon Bull.—Jonathan Baldwin, Berkshire, Vt., Dip.

Hungarian Cattle, Bull and Heifer.—R. L. Colt, Patterson, N. J., Dip., and thanks of the Society.

WORKING OXEN.—1. William L. Cowles, Conn., $20. 2. Lemuel Hurlbut, Conn., $15.

The Hungarian cattle were sent for exhibition by Roswell L. Colt, Esq., of Paterson, New Jersey. The committee consider them as an experiment in this country. Their usefulness has yet to be tested. We highly commend the enterprize that sent them here. We doubt, however, whether as much improvement to our American herds will be secured, as with the British stock which has been generally adopted. We recommend a Diploma and the thanks of the Society to Mr. Colt, for his public spirit in sending them to the exhibition.

HORSES. ALL WORK.

Judges.—Ela Merriam, Lewis co., chairman; Jonah Davis; G. P. Post, Hartford, Conn.

Stallion over four years old.—1. I. T. Grant, Schaghticoke, (Morse's Grey,) $20. 2. John L. Bennett, Montgomery co., (Sir Henry,) $12. 3. C. Canfield, Poughkeepsie, (Young Andrew,) $8. 4. Foster Breed, Crown Point, (Young Black Hawk,) Youatt.

Best brood mare, with foal at her foot.—1. E. Corning, jr., Albany, bay mare and brown colt, $20. 2. G. Van Olinda, Watervliet, gray mare and bay colt, $12. 3. P. F. Mesick, Columbia co., sorrel mare and sorrel colt, $8.

Recommended by the committee.—*Bay Stallion*, (Prem. last year,) Wm. Strever, (Diomede,) Columbia co., Dip.

There were a large number of stallions exhibited that do great credit to their owners.

DRAUGHT.

Judges.—Silas M. Burroughs, Orleans co., chairman; David Hill, Weybridge, Vt.; Teunis H. Ashton, Orleans co.

Stallion over four years old.—1. Joel Young, New Scotland, $20. 2. Wm. A. Keese, Peru, Clinton co., $12.

Best brood mare, with foal at her foot.—1. Wm. M. Bullock, Bethlehem, $20.

THOROUGH BRED.

Judges.—James H. Murray, M. D., Maryland, chairman; Edward Long, Cambridge; T. S. Faxton, Utica.

Stallions.—1. Mortimer De Motte, New-York, (Trustee) $20. 2. O. K. Lapham, Keeseville, (Leopard,) $12.

Recommended by the committee.—Horse "Consternation," that received 1st Premium 1845, J. B. Burnett, Syracuse, speel. Prem. Horse "Lance," received 1st Premium 1849, Wm. W. Huff, Buffalo, Dip.

The exhibition in this class was limited but of great excellence. The committee recommended that larger premiums be offered.

THREE YEAR OLD STALLIONS AND MARES.

Judges.—Dewitt Hasbrouck, Ulster co., chairman; John C. Stoothoff, Queens co.; Daniel B. Wright, Dutchess co.

Digitized by Google

Stallions.—1. Philip Hornbeck, Rochester, Ulster co., (Mahogany Bay,) $15. 2. A. H. Jaquith, Fonda, Mont. co., (Locomotive,) $10. 3. Harvey Kimberly, Columbia co., Youatt. 4. William Hunter, Watervliet, Trans.

Mares.—1. J. D. Kingsland, Clinton co., $15. 2. Peleg Cross, jr., Columbia co., $10. 3. John M. Taylor, Otsego co., Youatt. 4. John McCormick, Bethlehem, Trans.

The committee remark that the exhibitions in this class were of a superior order.

TWO YEAR OLD STALLIONS AND MARES.

Judges.—J. M. Mott, Rensselaer co., chairman; Ezekiel Spencer, Herkimer co.; Wm. Stevenson, Washington co.

Stallions.—1. Gerrit Van Olinda, Watervliet, $10. 2. John Muir, Sen., Hamilton, Mad. co., Youatt. 3. Isaac Bink, Greenbush, Rens. co., Trans.

Mares.—1. Isaac T. Grant, Schaghticoke, Rens. co., $10. 2. S. A. Gilbert, Hamilton, Mad. co., Youatt. 3. Daniel J. Day, Granville, Wash. co., Trans.

ONE YEAR OLD COLTS.

Judges.—H. W. Vail, Suffolk co., chairman; Obadiah Howland, Cayuga co.; Edward Munson, Cayuga co.

Stallions.—1. Wm. Strever, Kinderhook, $5. 2. Isaac Hoag, Easton, Wash. co., Youatt, 3. Abraham Oliver, New Scotland, Trans.

The colts exhibited in this class, to which premiums were awarded, were superior animals.

MATCHED HORSES.

Judges.—A. W. Clark, Jefferson co., chairman; Wm. Bacon, St. Lawrence co.; E. N. Pratt, Rensselaer co. m

For the Road.—1. J. B. Plumb, Albany, (pair blacks,) $15 and Dip. 2. Wm. C. Durant, Albany, (pair bays,) $10. 3. T. S. Faxton, Utica, $8. 4. John B. Borst, Montgomery co., $5.

For Draught.—1. John Butterfield, Utica, $10. 2. Jagger, Treadwell & Perry, Albany, $8. 3. C. V. S. Truax, Albany, $5.

The committee recommend a discretionary premium of a *Silver Medal* to Messrs. Reynolds & Wort, of New-York, for a pair of two year old Mules.

The committee remark that a large number of horses were entered, and for *quality* they think they have never been excelled. There were over 20 span which would do honor to the Empire State at any show.

GELDINGS.

Judges.—Henry Delamater, Rhinebeck, chairman; J. T. Blanchard, Saratoga; Isaac Butler, Dutchess co.

1. Lewis E. Smith, Mechanicsville, Saratoga co., (bay gelding,) $10 and Dip. 2. Theodore S. Faxton, Utica, $8. 3. Nathan Morgan, Victor, Ontario co., (chesnut sorrel gelding,) $6. 4. Silas W. Tobey, Hudson, $4.

The committee were much gratified with the unusual number of geldings exhibited, and their superior excellence, and express their regret that there were not at their disposal, other premiums. Several extraordinary

Digitized by Google

fine mares were exhibited, which the committee desire to notice as very superior in form and beauty of action.

Foreign Horses.

Judges.—James D. Wasson, Albany co., chairman; Charles D. Miller, Madison co.; John Tayler Cooper, Albany co.

Best thorough bred Stallion, over four years old.—Thos. Leach, C. W., (Reindeer,) $20 and Dip.

Best brood Mare.—Wm. L. Cowles, Farmington, Ct., $20 and Dip.

Best Stallion, horse of all work.—William Walker, Hartland, Vt., $20 and Dip.

Best Stallion, draught.—Elisha Norton, Chelsea, Vt., $20 and Dip. 2. Amos Bigelow, Bridport, Vt., $10. David Laurent, Canada, $10.

Best matched horses.—1. Andrew Holmes, Addison, Vt., $10. 2. B. B. Foss, Chelsea, Vt., $10.

L. D. Harlon's (Hartland, Vt.,) Stallion, "Gray Hawk," having been awarded the 1st premium last year, is now honored with the *Certificate* of the Society.

The committee remark that the number and excellence of the horses entered, rendered their task a very difficult one, and it was not without great hesitation, and after mature examination that they arrived at the awards made.

Sheep, Long Wooled.

Judges.—Stephen Haight, Dutchess co., chairman; Edwin A. Johnson, Suffolk co.; A. H. McLean, Livingston co.

Best buck over two years old.—Winants Younghans, Rens co., $10. 2. John A. Rathbun, Otsego co., $8. 3. John C. Collins, Columbia co., $5.

Best buck two years or under.—B. J. Hays, Mohawk, Montgomery co., $10. 2. Richard Gypson, Oneida co., $8. 3. B. J. Hays, Mohawk, Montgomery co., $5.

Best pen five ewes, over two years old.—John A. Rathbun, Springfield, Otsego co., $10. 2. Winants Younghans, Rens. co., $8. 3. William Rathbun, Springfield, Otsego co., $5.

Best pen five ewes, two years or under.—John C. Rathbun, Otsego co., $10. 2. J. C. Rathbun, Otsego co., $8. 3. E. Scace, Watervliet, $5.

Best pen five buck lambs.—Winants Younghans, Rens. co., $8. 2. William Rathbun, Otsego co., $3 and Morrell's Shepherd.

Best pen five ewe lambs.—Winants Younghans, Rens. co., $8. 2. John A. Rathbun, Otsego co., $3 and Morrell's Shepherd.

The show in this class was very fair in point of number, and a very spirited competition in this important branch of Agriculture was made, and the committee experienced not a little difficulty in deciding the relative merits of the respective animals.

Middle Wooled.

Judges.—Sanford Howard, Albany, chairman; William Teller, Rens. co.; William Howard, Cayuga co.

Best buck, over two years old.—J. M. Sherwood, Auburn, $10. 2. and 3, to be divided equally between F. M. Rotch, Butternuts, $6.50. J. McD. McIntyre, Albany, $6.50.

Digitized by Google

Best buck, two years or under.—Z. B. Wakeman, Herkimer, $10.

Best pen five ewes, over two years old.—J. M. Sherwood, Auburn, $10. 2. F. M. Rotch, Butternuts, $8. 3. Z. B. Wakeman, Herkimer, $5.

Best pen five ewes, two years old or under.—Z. B. Wakeman, Herkimer, $10. 2. J. McD. McIntyre, Albany, $8.

Best pen five buck lambs.—Z. B. Wakeman, Herkimer, $8. 2. J. McD. McIntyre, Albany, $3 and Morrell's Shepherd.

Best pen five ewe lambs.—Z. B. Wakeman, Herkimer, $8. 2. J. McD. McIntyre, Albany, $3 and Morrell's Shepherd.

All the sheep, to which premiums were awarded, were full blood South Downs. Mr. McIntyre exhibited a cross bred, South Down and Cotswold ewe, with her lamb, which was a fine model of a mutton sheep.

MERINOS.

Judges.—W. C. Watson, Port Kent, chairman; C. L. Whitney, Granville, Ohio; Peter Saxe, Orleans co.

Best buck over two years old.—N. M. Dart, Harpersfield, $10. 2. Orrin Lathrop, Darien, Gen. co., $8. 3. Joseph Haswell, Hoosick, $5.

Best buck, two years or under.—L. H. Yates, Darien, $10. 2. Lewis G. Collins, Dutchess co., $8. 3. J. M. Sherwood, Auburn, $5.

Best pen five ewes, over two years—Robert E. Keese, Ausable, $10. 2. L. H. Yates, Darien, $8. 3. F. M. Rotch, Otsego co., $5.

Best pen five ewes, two years and under.—Lewis G. Collins, Dutchess, $10. 2. Robt. E. Keese, Clinton co., $8. 3. N. M. Dart, Harpersfield, $5.

Best pen five buck lambs.—L. G. Collins, Dutchess co., $8. 2. R. E. Keese, Clinton co., $3 and Morrell's Shepherd.

Best pen five ewe lambs.—R. E. Keese, Clinton co., $8. 2. L. G. Collins, Dutchess co., $3 and Morrell's Shepherd.

The committee experienced much difficulty in making their awards, from the fact that some of the sheep had their fleeces on, while others had been shorn. They endeavored, however, to take these circumstances into consideration, and to make the proper allowance for them. The committee recommend that hereafter the sheep exhibited should be uniform, and that the Society adopt a rule on the subject, requiring them in all cases to be shorn the season previous to the exhibition, and a tuft of wool to be retained.

The committee have not regarded as an element of primary excellence, mere weight of carcass, but in forming their awards, have had reference to the combination of excellent qualities in reference to contour and appearance of the animal, the fiber and style of the fleece, the general character of the animal for breeding. The committee would suggest that sheep of the same classes be placed as nearly contiguous to each other as possible; the bucks near together, the ewes and lambs also; this would greatly facilitate the labors of the judges, and enable them by a direct comparison of animals to arrive at conclusions more satisfactory to themselves and more just to competitors.

SAXONS.

Judges.—Augustus Sanford, Chenango co., chairman; Oliver Cooke; Wm. D. Dickinson, Ontario.

Best buck over two years.—S. H. Church, Vernon, Oneida co., $10. 2. Ransom & Baker, Hoosick, Rens. co., $8. 3. Joseph Haswell, Hoosick, $5.

Digitized by Google

Best buck, two years or under.—S. H. Church, Vernon, Oneida co., $10. 2. Ransom & Baker, Hoosick, $8.

Best pen five ewes, over two years.—S. H. Church, Vernon, $10. 2. Joseph Haswell, Hoosick, $8.

Best pen five ewes, two years or under.—S. H. Church, Vernon, $10. 2. Ransom & Baker, Hoosick, $8. 3. Frederick Phelps, Schodack, $5.

Best pen five buck lambs.—Ransom & Baker, Hoosick, $8. 2. Joseph Haswell, Hoosick, $3 and Morrell's Shepherd.

Best pen five ewe lambs.—Joseph Haswell, Hoosick, $8. 2. Ransom & Baker, Hoosick, $3 and Morrell's Shepherd.

SAMPLE WOOL—*Best sample of wool, ten fleeces.*—John P. Beekman, Kinderhook, Columbia co., Silver Medal.

SHEPHERD'S DOG—*Best Shepherd's dog.*—John Campbell, Middlebury, Vt., $5. 2. Robert Middlemist, West Meredith, Del. co., Morrell's Shepherd.

The committee exceedingly regret that there was not a larger number of competitors for premiums, both on sheep and wool, when we take into account the large number of pure Saxons embraced within the bounds of the State. Yet from the best information we can get, and from general observation, it would seem that the pure Saxon breeds, are getting into disfavor with most of the wool-growers of this State. This is doubtless owing to the low price of fine wool for the last few years, and the smaller quantity produced by this breed, than from some other breeds of sheep. This idea having become prevalent with many of the breeders of pure Saxons, they have neglected to keep up the quality of their flocks, so essential to the profitable growing of fine wool, and have either suffered them to degenerate, or have merged them with other breeds. This breed of sheep is desirable principally on account of the fineness of their wool; hence the attention of the grower should be directed to the *quality*, as well as quantity of wool produced. That these two objects can be attained by proper attention, the committee have no doubt.

The object of the farmer is to keep that breed of sheep, which will net him the most profit. This can only be ascertained by actual experiment, under equally favorable circumstances. The committee, without going into detail upon this subject, beg leave to refer to a few facts, in connection with the flocks owned by the successful competitors for premiums. The flock belonging to S. H. Church, of Vernon, Oneida co., to whom much credit is due, for the attention which he has given to this subject, and the skilful manner with which he has managed his flock, may be mentioned. This flock is justly celebrated for the superior quality of wool produced, and for the fine symmetry of the sheep, a point of much importance in breeding. Mr. Church, the present year, clipped from his sheep, an average of 2¾ lbs. of wool per head, for which he obtained 60 cents per pound, making one dollar and sixty-five cents per head; and this, notwithstanding his clip this season, was unusually light. Few of the coarser breeds, we imagine, exceeded more per head for wool than this. Mr. Church is now endeavoring to increase the quantity of wool, which he thinks he can raise to three pounds per head, without impairing the quality or value. The committee have no doubt that with proper attention to breeding, a flock of pure Saxons, may be made to yield, at least, two dollars'worth of wool per head, at present prices. In view of these facts, would it not be well for those having flocks of Saxons, to go on improving them, rather than change them for other and coarser breeds?

Digitized by Google

The other gentlemen named, as having obtained premiums, are also entitled to much credit for their skill in breeding fine wooled sheep. Mr. Joseph Haswell, of Hoosick, whose flock numbers over eight hundred, has succeeded in bringing them up to 3¼ lbs. per head, without impairing the quality of the wool. He has also paid much attention to symmetry of form, as well as evenness of fleece in quality. Messrs. Ransom & Baker, also of Hoosick, presented some very fine specimens from their flock, which already numbers eleven hundred, and which they are evidently taking pains to improve.

Specimens of Wool.—The committee would remark that the specimens of wool presented, were not in as good condition as was desirable. It is all important, if the wool-grower wishes to obtain a high price for his wool and establish a reputation in his profession, that it be prepared for the market in the best possible manner.

The committee have not time to extend their remarks upon this subject, though much might be said tending to correct the evils prevalent among wool-growers, both in relation to the breeding of sheep and preparing the wool for market.

NATIVES AND GRADES.

Judges.—M. Y. Tilden, New Lebanon, chairman; Andrew Mitchell, Montgomery; Stephen J. Matson, Rensselaer.

Best buck, over two years.—No premium awarded. 2. Daniel S. Curtis, Canaan, Col. co., $8.

Best buck, two years or under.—Daniel S. Curtis, Canaan, $10. 2. R. C. Derrick, Brunswick, $8.

Best pen five ewes, over two years.—Daniel S. Curtis, Canaan, $10. 2. E. R. Dix, Vernon, Oneida co., $8.

Best pen five ewes, two years or under.—None awarded. 2. Daniel S. Curtis, Canaan, $8.

Best pen five buck lambs.—2. Daniel S. Curtis, Canaan, $3 and Morrell's Shepherd.

Best pen five ewe lambs.—Richard Gypson, Westmoreland, $8. 2. Daniel S. Curtis, Canaan, $3 and Morrell's Shepherd.

FOREIGN SHEEP. LONG AND MIDDLE WOOLED.

Judges.—Morgan L. Butler, Oneida, chairman; James D. Van Vechten, Rensselaer; William Robson, Oneida.

LONG WOOLED—*Best buck.*—William Miller, Markham, C. W., $10.

Best pen five ewes.—William Miller, Markham, C. W., $10.

MIDDLE WOOLED—*Best buck.*—William Miller, Markham, C. W. $10.

Best pen five ewes.—William Miller, Markham, C. W., $10.

Best pen five buck lambs.—William Miller, Markham, C. W., $5.

The committee do not hesitate in pronouncing this class of sheep superior in every point, and worthy the notice of wool-growers throughout the State. In point of carcass they are unequaled.

MERINOS AND SAXONS.

Judges.—Wm. T. Sammons, Fulton, chairman; James Farr, Washington; Matthias Hutchinson, Cayuga.

MERINOS—*Best buck.*—John Campbell, Middlebury, Vt., $10.

Best pen five ewes.—Jesse Hinds, Rutland, Vt., $10.

Best pen five buck lambs.—George Campbell, Westminster, Vt., $5.

Digitized by Google

Best pen five ewe lambs.—George Campbell, Westminster, Vt., $5.

SAXONS—*Best buck.*—C. B. Smith, Wolcottville, Conn., $10.

Best pen five ewes.—C. B. Smith, Wolcottville, Conn., $10.

Best pen five buck lambs.—George Campbell, Westminster, Vt., $5.

The committee were happily disappointed in the number and quality of sheep exhibited in this class. A large number were entered for competition, and also quite a number for exhibition, only. The committee were much embarrassed in deciding upon the merits of the animals offered for premiums, as there were many very nearly equal in quality. The sheep exhibited by the Messrs. Binghams, of Vermont, were among the best ever seen by the committee, of their breed, and do great credit to these gentlemen, and have added largely to the interest of this Fair, and will be the means of increasing the products of our flocks, as well as the wealth of our country.

SWINE.

Judges.—Wm. Logan, Fulton, chairman; Geo. S. Willis, Pittsfield, Mass.; Francis B. Van Buren, Herkimer.

Best boar one year old.—Winants Younghans, Rens. co., $10. 2. Jas. P. Noxon, White Creek, Wash. co., $5.

Best boar six months and under one year.—William Webb, Darien, Gen. co., $8. 2. William Comstock, Laurens, Otsego co., $3.

Boar pig, four months old, highly commended, belonging to Jacob Taylor, Rens. co.

BREEDING SOWS—*Best breeding sow over two years old.*—William Comstock, Laurens, Otsego co., $10. 2. William Hurst, Albany, $5.

Breeding sow one year old.—2. Lawrence Salisbury, Lansingburgh, $5.

Best sow six months, and under one year.—William Hurst, Albany, $8.

Best lot of pigs, not less than five, under ten months old.—R. C. Derrick, Brunswick, $10.

Discretionary.—Suffolk pigs, (very fine.)—Samuel Morgan, Watervliet, $3.

The committee regret that there was not a more extensive exhibition of swine, in a region so famed as this has been for its superior swine.

POULTRY.

Judges.—C. N. Bement, Albany, chairman; Orlando Allen, Buffalo; J. S. Walsh, Albany.

Best lot Dorkings.—Francis M. Rotch, Butternuts, $3.

Best lot Polands.—M. D. Waud, Lansingburgh, $3.

Best lot of Malay or Chittagong.—E. E. Platt, Albany, $3.

Best lot of Shanghae.—R. L. Colt, New Jersey, $3.

Best lot of Bantams.—E. E. Platt, Albany, $3.

Best lot of poultry.—John Chadwick, New Hartford, Oneida co., $10.

Discretionary premiums recommended to the following persons:

Silver top knot fowls.—E. E. Platt, Albany, $3.

Shanghae chickens.—B. B. Kirtland, Greenbush, $3.

Black Java fowls, with a specimen of large sized eggs.—Dudley Walsh, Bethlehem, $3.

Specimens of China, Dorking, and Malay, crossed.—J. M. Lovett, Albany, $3.

Digitized by Google

Curassau or Mexican Pheasant.—E. E. Platt, Albany, $3.
Turkies.—R. L. Colt, Paterson, New Jersey, $3.
Muscovy ducks.—R. L Colt, Paterson, N. J., $3.
Small ducks.—Wm. Robson, Westmoreland, Oneida co., $3.
Large geese.—L. F. Allen, Buffalo, $3.
Wild geese.—Edward Van Alstyne, Greenbush, $3.
Bremen geese.—Wm. Robson, Westmoreland, $3.
China geese.—R. L. Colt, Paterson, N. J., $3.

RABBITS.

Very large French Rabbits.—R. H. Van Rensselaer, Butternuts, $3.
Pair of beautiful fawns.—Aaron Sturges, Hamilton co., $3.

Class B. PLOWS.

REPORT ON THE TRIAL OF PLOWS.

The committee on the trial of plows, for the New-York State Agricultural Society, report:

That in pursuance of the directions of the Society, they assembled in the city of Albany, on Monday the 3d day of June, 1850, and immediately proceeded to perform such preliminary duties as would be necessary for the success of the ensuing trials.

On Tuesday, the 4th, the trial of the plows commenced, in competition for the following premiums offered by the Society, viz:

Best sod plow for stiff soils, furrow not less than seven inches in depth, nor over ten inches in width, Diploma and $15. Second best do, $10.

Best sod plow for light soils, furrows not less than six inches deep and twelve inches wide, Diploma and $15. Second best do, $10.

Best plow for "fallows" or old land, Diploma and $10. Second do, $8.

Best sub-soil plow, Diploma and $8.

Best side-hill plow, Diploma and $8.

The first trials were on fallows or old land, on the farm of J. Lansing, at Greenbush. The field selected was hilly; the soil was a stiff loam, inclining to clay, mingled with stones of various sizes. There had been almost continuous rains for three weeks previous, and the ground was, for the most part, thoroughly saturated with water, and the greater portion of it had been recently covered with a coating of long manure.

In consequence of the inequalities of the surface of the field, there was necessarily a diversity in the various lands and sections,—some being more stony, wet, or adhesive, than others. This source of fallacy was guarded against by your committee as far as they could, by taking copious notes of the physical condition of the different lands, and making due allowances when determining the awards. The vegetable matter on the ground was not sufficiently thick to prove any serious impediment to the operation of the implements. After the competitors had drawn for the number of their lots, the following rules for regulating the awards were announced in the hearing of each competitor:

Rules regulating the trial.—In deciding the general question—What are the best plows? the committee will be governed by the following principles: 1st, the character of the work performed; 2d, the power required in draught; 3d, quality of materials, durability and cost of the implements.

For *stiff soil*, excellence of work shall consist, first, in leaving the fur

Digitized by Google

row slice light and friable; second, in so disposing the sod and all vegetable matter as to ensure its ready decomposition.

For *sandy soil*, or that which is already too light, the points in regard to work will be, first, thoroughly burying the vegetable matter; and second, leaving the ground generally level.

For *fallows*, or old land, the principle in reference to the quality of the work will be, the thorough pulverization and friability of the soil.

In determining the power required in draught, the most perfect instrument will be used, and the trial will be conducted in the most careful and thorough manner.

The same implement for testing draught, and the same team will be used for all plows in the same class.

The plows may be held by the competitors, or persons appointed by them, as may be preferred.

The trial being open to competitors from any part of the world, fourteen plows were entered for premiums.

Old land trials.—Before commencing the work the committee passed the following resolution, viz;

Resolved, That the plow which effects the most thorough pulverization and inversion of the soil, with a depth of furrow of seven inches, shall be deemed to make the best work.

Name of Competitors.	Name of Plow.	Name of Plowman.	Dft.	Wt. Plow.	Price Plow.
A. Fleck,	Wilkie's Scotch,	M. Hutchinson,	487	175	$28 00
French & Smith,	Michigan Sod and Sub-soil,	J. Brydon,	406	174	12 00
Eddy & Co.,	Washington co. Iron Beam D.,	S. R. Mott,	439	112	10 00
John Randerson,	Schodack,	John Randerson,	342	109	8 00
Miner & Horton,	Peekskill, No. 21,	J. Mooney,	363	107	7 50
Starbuck & Co,	Trojan, No. 5,	S. G. Smith,	379	109	9 00
P. Auld,	Improved Scotch,	T. Williams,	373	116	9 50
Prouty & Mears,	Center draft, No. 5½,	J. Mooney,	383	119	12 00
Bosworth, Rich & Co.,	Iron Beam D,	T. Leonard,	425	109½	8 50
R. R. Finch, & Co.,	Empire A 3,	M. M. Webster,	456	99½	10 00
H. L. Emery,	Albany,	H. L. Emery,	427	133	10 50
W. U. Chase,	Amsterdam, No. 6,	J. Mooney,	342	129½	
E J. Burrall,	Shell-wheel,	E. Smith,	350	126	11 00
Prouty & Mears,	Connecticut Valley,	J. Mooney,	525	99½	10 50

The lands were marked out 162 feet long, and 23 feet wide. The preceding table exhibits, 1st, the name of the proprietor of the plow; 2d, the name of the plow; 3d, the name of the plowman; 4th, the draft of the plow; 5th, the weight of the plow; and 6th, the price.

While the plows were in action, they were carefully watched by the committee, and every circumstance which they deemed essential was noted. The appearance of the land after plowing, its friability, the comparative time of drying, the amount of vegetable matter left uncovered, were then carefully examined. The result of their observations is summed up in the following remarks:

A. Fleck's *Wilkie's Scotch Plow.*—Performed work in a handsome manner; the furrows were high set, and their form was well adapted to cover the seed with a friable soil after it had passed under the action of the harrow. The materials of the implement were of the best quality, being wholly of iron, and all the portions of it, except those exposed to the abrasion of the furrow-slice, appeared almost indestructible. In our opinion it is liable to the following objections: 1st. Its draft is heavy. 2d. Its weight makes it too laborious for the plowman to handle, particularly where the furrows are short, and the turnings are consequently frequent. 3d. Its price is too

Digitized by Google

great for the means of ordinary farmers. 4th. It requires a more thorough training on the part of the plowman, than is ordinarily attained by the farmers of this country. 5th. The bottom of the furrow is left uneven, that portion of the bottom contiguous to the land-side, being deeper than the portion nearest the furrow side. It is evident that this cut gives less friable earth adapted to the exigencies of the crop than if it were level at the bottom.

FRENCH & SMITH'S *Michigan Sod and Sub-soil.*—We shall not notice this plow minutely in this connexion, reserving our remarks for a subsequent part of this report.

EDDY & CO.'S *Washington Co. Iron beam D.*—This is a strong and well made plow; the beam is of wrought iron, and we should suppose from its construction, that it was well adapted for very rough and stony land. Its draft is heavy, and the mould-board presses heavily on the upper and lower edges of the furrow, so as to leave the surface exposed after plowing, curved, from the effect of the pressure. This peculiar action not only expends power wastefully, but packs the earth which ought to be pulverized.

RANDERSON'S *Schodack plow.*—The good qualities of this plow were brought out in the fullest relief by Mr. Randerson, whose expertness as a plowman was particularly observed. The lightness of draft of this plow is very remarkable; this was seen as distinctly in the action of the team as from the indications of the dynamometer. It also possesses another quality which will recommend it to many farmers; it can be used by an inexpert plowman with better effect than most of the plows exhibited; it runs easily without turning towards the land or from it, and when once guaged, it keeps the required depth with great steadiness. Since good plowmen are procured with so much difficulty in many places, this quality of the plow will prove of great value. With these qualities, it fails in its pulverizing action; the furrow-slice is simply turned, with scarcely any comminution of its particles, and it does not bury the grass and other vegetable matters on the surface, with that thoroughness which good husbandry requires.

MINER & HORTON'S *Peekskill Plow*, No. 21.—Those of your committee who have watched the operation of plows for several years in succession which have been exhibited at our annual Fairs, are no strangers to the excellence of this implement. It is constructed throughout by a rule, which was exhibited to some of the members of your committee several years ago. At each successive exhibition, competitors have approximated more and more closely to this plow, and the great excellence of many of the plows manufactured in this State, is due to the skill and ingenuity of Messrs. Miner & Horton. No. 21 turns an excellent furrow, surpasses most in pulverization, buries the vegetable matter well, is strong in its construction, durable in its materials, moderate in price, and light in its draft. But in our opinion would be improved, by an apparatus by which the breadth and depth of its furrow could be more readily and accurately adjusted.

STARBUCK & CO.'S *Trojan No.* 5.—The proprietors of this plow were unfortunate in drawing their lot, as it was undoubtedly the worst on the ground. It was situated at the base of a side hill, receiving its drainage. At the time of the trial it was very wet, excessively stony, and covered with a ranker herbage than any other lot on the field. The confidence of the proprietors in the excellence of the implement was very strikingly exhibited by their submission to its being tested without the slightest remonstrance under circumstances so decidedly unfavorable. It is undoubtedly

Digitized by Google

difficult for any judges to make a proper allowance for these inequalities in the physical condition of different lots, and it is possible that injustice may be done in spite of the greatest care and impartiality; but your committee in making their award, endeavored, individually, to be fully persuaded in their own minds. *Trojan, No.* 5, is undoubtedly an excellent plow, and in its capacity for turning under weeds and stubble *without choking*, is probably unsurpassed by any plow at the exhibition.

P. AULD'S *Improved Scotch plow*, made good work. It seems well adapted to adhesive soils, as from its form and the quality of the metal used, it will *scour* well. It lacks the apparatus for proper adjustment, which renders it somewhat difficult of management.

PROUTY & MEARS, *Center Draft, No.* 5½.—This plow possesses an extraordinary combination of excellencies. The point or share presents a gradual, easy rise of the furrow to the mould-board, which is on a gentle spiral curve, in its transverse and diagonal sections, and of such length as to insure a free and easy delivery of the furrow at its after end, and not requiring the foot of the plowman to prevent its falling back from whence it came, and having the cohesion of its particles so far disturbed as to admit of the genial influences of the sun and rain, those powerful agents of decomposition. It is of that peculiar structure which is so well adapted to the form which the under side of the furrow naturally assumes, in the process of being inverted, that after a few hours' service, not an inch will be found which is not polished by the passing furrow.

The *center draft* principle, seems almost universally misapprehended by most farmers and plow makers, although it has been the characteristic feature of Messrs. Prouty & Mears' plows for many years. Most persons suppose that this appellation refers to the draft-rod, which dispenses with the application of the power at the extremity of the beam; but this is not so. It takes its name from the approximation of the beam to the central section of the implement, most other plows having the beam placed directly over the perpendicular land-side. The land-side makes an acute angle with a perpendicular, from the sole of the plow, and hence the furrow-slice, instead of being rectangular, is rhomboidal. The combined action of the coulter and plow, loosens the earth composing the acute angle, so that when the furrow-slice laps on the preceding one, the loose earth falls into the channel made by the lapping of the furrows and completely buries the protruding vegetation. This feature of the plow is looked upon by your committee with great favor, as it is almost impossible for a rectangular furrow-slice to be so laid as to shut in the grass so as to insure its decomposition, and to repress its growth.

The inclination of the land-side also brings the *standard* on which the beam is placed within the body of the plow, the front edge of which is thrown forwards in a curve under the beam, so as to prevent the vegetable matters on the surface from lodging on, and choking the plow. The after part of the head of the standard, is extended in such manner as to secure the beam and land-side more perfectly, and being within the body of the plow, it admits of the position of the beam being in a line parallel with the land-side, and also causes the line of draft of the latter, and the line of motion of the plow, to be parallel one to the other.

As the draft rod and other apparatus of adjustment attached to this plow, are in some respects peculiar, we subjoin Messrs. Prouty & Mears' description thereof.

"THE DRAFT ROD.—The under side of the fore end of the beam of

Digitized by Google

common length, is elevated from two to five inches above the level of the standard at its junction with the beam. At the fore end of the beam is secured a metallic graduating arc, having a slot of about six inches lateral extent, and through which is passed, vertically, an eye-bolt of about ten inches in length—about eight inches forming a male screw, the female consisting of a nut on the under, and a powerful thumb nut, or knob nut, on the upper side of the graduating arc. By means of this arc, nuts and screw, the eye of the bolt may be elevated or depressed, and also passed to the right or left of the center, and thus secured in its position—thus adjusting the line of draft with great accuracy. In front of the standard, under the beam, embracing its sides and extending up back of the standard-bolt, is a clevis, having its ends secured by a strong bolt through the beam.

This clevis has three notches to admit the hook on the end of the draft rod. One central, and one extending out on either side of the beam. The draft rod is a bar of round iron—having at one end an eye to draw by, and at the other is formed a suitable hook or eye by which it is attached to the clevis after having been passed through the eye of the adjusting screw bolt.

"This apparatus, when applied to Prouty & Mears plow, (the land-side and standard of which are inclined, and the beam on a line parallel with the land-side,) admits of the plow carrying its proper width of furrow when drawn by two or more horses walking in the furrow, when the draft rod is hitched into the right hand notch of the clevis and full to the right in the graduating arc. Hitch central in the clevis, and set central in the arc and it follows equally well, a yoke of oxen or a pair of horses. Let the rod be hooked into the notch on the left of the beam, and moved to the left of the arc, and it follows the team of three horses abreast as perfectly as before, in each instance holding its width and depth of furrow, turning over and completely covering the sod and all vegetable matter.

To sum up the merits of this plow, it appears to us that it combines in a very remarkable degree the somewhat opposite qualities of ease of draft with pulverizing power; it buries the vegetable matter very thoroughly; it is made of very excellent materials; it is not expensive; the workmanship is of the best quality; it can be easily repaired, and facility in its use is easily acquired by the plowman. It is steady and equable in its motion, requiring little labor on the part of the plowman, and is susceptible of most accurate adjustment. The commendation which we have bestowed on the durability of the materials, strength of construction, neatness of finish, and general excellence of workmanship exhibited in this plow, applies with equal force to all the plows exhibited by the same proprietors.

BOSWORTH, RICH & CO.'s *Iron beam D.*—This plow has the merit of being the cheapest of any exhibited. Its construction gives it some advantages in plowing in stumpy land, and from its facility in turning, it is convenient where the furrows are very short. But your committee are constrained to say that the work performed by this plow, does not meet their approbation, as it requires too much aid from the foot of the plowman to place the furrow-slice in a proper position. It packs and solidifies the furrow-slice in consequence of the pressure of the hinder part of the mould board; the draft is heavy, and its action is vibratory and unsteady.

FINCH'S *Empire A 3.* The same objections apply to this plow as to Randerson's, but it presses the furrow harder and requires more power.

H.L. EMERY'S *Albany plow*, does good work, except that it fails to bury the stubble well.

Digitized by Google

W. U. CHASE'S *Amsterdam plow No.* 6.—This implement was not properly adjusted for showing its peculiar properties, and therefore your committee hazard no remarks on its action.

E. J. BURRALL'S *Shell-wheel plow.*—Much ingenuity is displayed in the construction of this plow, and from inspection, and from theoretical considerations, we should have been inclined to attribute to it valuable qualities; but it failed to effect a thorough pulverization of the soil, and to cover under the vegetable matter, without assistance from the foot of the plowman.

PROUTY & MEARS' *Connecticut Valley plow.*—We cannot entertain a doubt of the excellence of the execution of this implement in soils adapted to its use; but it was not adapted to the soil where it was tried in our presence.

Your committee have thus passed in review all the plows offered for competition in this particular kind of land, and have given their opinions so far as they know their own hearts, with entire impartiality. They would have praised with far greater pleasure than they have blamed; but their duty to the Society, and to the farmers of the State, seemed imperiously to require that they should honestly state the facts as they presented themselves to their view, with their conclusions, without fear, favor or affection.

Stiff soil trials.—Having thus finished the trial of plows on "Old Ground," they proceeded to test those entered for plowing stiff sod.

The field selected was of a stiff clay soil, with a smooth and almost level surface, generally free from stones, in a very wet condition from recent rains, and covered with a sod which had been unplowed for many years. The size of furrow-slice prescribed by the rules was seven inches by ten inches. The lands were 150 feet long by 23 feet wide. Twenty-two plows were entered for competition, and the annexed table shows, 1st, the name of the competitor; 2d, the name of the plow; 3d, the draft; 4th, size of furrow; 5th the price of the plow, and 6th, the weight of the plow.

Names of competitors.	Name of Plow.	Dft.	Size of furrow.	Price of Plow.	Wt. of Plow.
French & Smith,	Michigan sod and sub-soil,	500	8 by 10	$13 00	174
Miner & Horton,	No. 21,	425	7 by 10	7 50	167
French & Smith,	Michigan Joint plow,	510	7½ by 12	10 00	
Eddy & Co	Washington Co. D.,	450	7 by 12	10 00	119½
Miner & Horton,	No. 22,	550	7 by 12		
Prouty & Co.,	Center draft, No. 25,	490	7 by 11	11 50	199
H. L. Emery,	Albany,	480	7 by 11	10 50	122
Bosworth & Rich,	Right and Left,	550	7 by 10	7 00	123
Finch,	Empire A 3,	525	7 by 12	8 75	99½
Gilbert,	New Jersey,	560	7 by 12	6 00	93
Starbuck & Co.,	Trojan No. 5,	425	7 by 12	9 00	109
Scott,	Ohio,	650			
Prouty & Co.,	Center draft, 5½,	470	7½ by 11½	12 00	119
Prouty & Co.,	Center draft, No. 30,	450	7 by 10½	10 50	99½
Bosworth, Rich & Co.,	Iron Beam E D,	380	7 by 10	8 50	102½
W. U. Chase,	Amsterdam, No. 2,	500	7 by 11		114
John Randerson,	Schodack,	390	6½ by 10½	8 00	109
Starbuck & Co.,	Iron Beam,	410	7 by 12	8 50	
A. Fleck,	Wilkie's Scotch swing,	475	7 by 10	28 00	175
Starbuck & Co.,	Trojan No. 3,	460	7½ by 12		
P. Auld,	Improved Scotch,	475	7 by 11	9 50	112½
E. J. Burrall,	Shell Wheel,	410	7 by 11	11 00	195

FRENCH & SMITH'S *Michigan Sod and Sub-soil.*—We reserve our remarks on this plow for another place.

MINER & HORTON'S *Peekskill Plow No.* 21.—This plow does excellent work, though intended for a wider furrow, and working disadvantageously in this. It yet made good work, pulverising the soil in a satisfactory manner. This plow, as well as No. 22, hereinafter mentioned, was held by a

Digitized by Google

person unaccustomed to the implement, and for that reason all the excellencies of the plows were not developed. It runs with great steadiness, and requires very little interference on the part of the holder.

FRENCH & SMITH'S *Michigan Joint Plow.*—This implement has merits, but is inferior to the "Sod and Sub-soil Plow" of the same proprietors.

EDDY & CO.'S *Washington Co. D.*—This plow is not calculated for so deep a furrow as seven inches. When working at this depth, much power is expended upon the furrow slice which is hardened and polished by the pressure. It cleans out the bottom of the furrow well, and runs very steadily.

MINER & HORTON'S *Peekskill No.* 22.—This Plow does not leave the land as light as No. 21, nor is it as well adapted for the work required by the rules.

PROUTY & MEARS' *Center Draft No.* 25.—Leaves the furrow too flat and heavy for stiff soils, but buries the grass satisfactorily.

H. L. EMERY'S *Albany Plow.*—The furrows were smoothly cut, but the grass was not well covered, and the soil not sufficiently pulverized.

BOSWORTH, RICH & CO.'S *Right and Left Hand Plow.*—This plow performed its work admirably, with a single exception of the great power which was required to operate it. It pulverized the soil well, and buried the grass very thoroughly.

FINCH'S *Empire A* 3.—This plow has but little pulverizing action, and leaves the furrow slice heavy; but runs squarely and steadily.

GILBERT'S *New Jersey Plow.*—Was worked without a wheel, and was deficient in apparatus for accurate adjustment, and its furrows were cut unequally as to depth and width. It requires too much power, when running seven inches deep, to become a favorite with our farmers.

STARBUCK & CO.'S *Trojan No.* 5.—This is a valuable plow, and will undoubtedly be a favorite with many farmers; it lays its furrows smoothly and evenly, but does not pulverize the soil or bury the grass as well as the standard of good plowing requires. This plow, like many others which were exhibited, took too wide a furrow in proportion to its depth. We deem the growing tendency among plow makers to adapt their implements to a wide furrow-slice, as an evil sign of the times, fraught with the worst results to the cause of agriculture. No fault is attributable to the makers for this; they only comply with the demands of their customers, but we think it high time that an earnest effort was made to disabuse the minds of *Farmers* of this error, as it is one which must necessarily diminish the returns of their labor. Like all the plows made by these gentlemen, it is of easy draft. Messrs. Starbuck's plows were all held by Mr. Smith, who exhibited admirable skill as a plowman, and brought out their good qualities in the amplest manner.

SCOTT'S *Ohio Plow.*—The proprietor of this plow stated that it was not prepared for working, and requested no remarks in regard to it.

PROUTY & MEARS' *Center Draft No.* 5½.—Made good work, but takes too wide a furrow to do the required work on this soil in the best manner.

PROUTY & MEARS' *Center Draft No.* 30.—The general form of this plow is similar to that of the "5½," except that it is calculated to do deeper work in proportion to the width, which is a great advantage for stiff soils. Lightness and friability are the main objects to be attained on such soils. They should be plowed *fine* and well pulverized, not only for the purpose of making a suitable seed-bed, but in order that the action of the air may develope and render soluble the latent vegetable food which they contain.

Digitized by Google

The operation of this plow was highly satisfactory in these respects. The furrow-slice was cut with great uniformity, (as per table,) and it was left beautifully open and light, while the grass was so completely covered as to prevent its growth. This was particularly observed by the judges, who visited the field five days after the work had been done, (during which interval there had been a fall of rain,) in order to compare the condition of the land plowed by the different implements. The lot plowed by this plow, lay considerably on what had formerly been the track of a road, which made that part of the soil, especially towards the bottom of the furrow, very hard, and increased the draft; yet the instrument held its depth well throughout. The attachment of the draft-rod to that part of the beam nearest the center of the plow's weight, is thought to have a favorable effect in keeping it to its depth and giving steadiness of motion.

Bosworth, Rich & Co.'s *Iron Beam E D.*—This plow required less power than any other on the ground, but it was deficient in pulverizing action, and covered the grass imperfectly; and the sod required the foot of the plowman to assist in its inversion.

W. U. Chase's *Amsterdam Plow, No.* 2.—A good, substantial, and cheap implement. Sufficient pains had not been taken in its adjustment before trial, and the plowman not being accustomed to its use, all its good qualities were not made apparent.

Randerson's *Schodack Plow.*—The remarks on this plow, under "old land" plowing, will apply in this connection. It is proper to state, also, that it did not, generally, work to the depth required. In this instance, twelve furrows were plowed before the dynamometer was put on, the average depth of which was not over six inches; and when the implement was put down to seven inches, for the purpose of testing the draft by the dynamometer, the furrows plowed showed very conspicuously above the rest of the land. The great difference in the power required to plow six inches, and that required for seven inches, will account, in a considerable degree, for the ease and expedition with which Mr. Randerson's horses moved.

Starbuck & Co.'s *Iron Beam.*—Similar to the "Trojan" No. 5, but does not work quite as evenly and smoothly as that.

A. Fleck's *Wilkie's Scotch Plow.*—This plow operated with great regularity, cutting its furrows seven inches by ten, with uniformity and precision, leaving the edges or corners high, and exposing to the air a large proportion of the slice. At the time of the examination of the field by the committee, the lot plowed with this plow was found to be in a much drier and lighter condition than most of the lots, and at a subsequent examination it was noticed that but little grass had grown between the furrows, a result which was owing to the furrow-slice having been left in so friable a state that the ridges had crumbled down and closed the interstices. The bottom of the furrows, though cut more squarely here than on old land, (a different share having been used,) was still liable to the same objection as mentioned in that case. The plowman, Matthew Hutchinson, is a very superior workman, possessing all the qualities which make the true plowman, and we should neglect a most pleasing duty, were we to fail in unanimously awarding him the praise which his work so richly merits.

Starbuck's *Trojan, No.* 3.—Makes good work, and buries the vegetable matter better than any other plow by these makers.

E. J. Burrall's *Shell Wheel Plow.*—Is substantially made, but is deficient in pulverization and in burying sod.

The committee examined the various lands with great care, on the com-

Digitized by Google

pletion of the trials. Five days afterwards they examined them again, and three weeks subsequently a part of the committee examined the work, and the opinions above given are the result of their combined inspections.

SANDY SOD SOILS.—Our next trials were in a sandy sod soil, situated on the island, north of the railroad depot. The soil was an alluvial sand, with a very tough sward, which had not been disturbed for twenty years, and which had been used for pasturage during that period. The lands were of the same length and breadth as those on the "stiff sod" trials. The following table indicates the draft of each plow:

Names of Competitors.	Name of Plow.	Draft.
Finch & Co.,	Small Empire,	490
Miner & Horton,	Peekskill, No. 21,	380
Miner & Horton,	Peekskill, No. 20,	370
W. U. Chase,	Amsterdam, No. 2,	350
French & Smith,	Michigan Joint,	440
French & Smith,	Michigan Sod and Sub-Soil,	450
Starbuck & Co.,	Iron Beam,	390
Wm. U. Chase,	Amsterdam, No. 6,	395
Bosworth, Rich & Co.,	D,	410
Starbuck & Co.,	Trojan, No. 5,	350
Finch & Co.,	Large Empire,	430
Randerson,	Schodack,	340
H. L. Emery,	Albany,	420
Bosworth & Rich,	Right and Left,	510
Bosworth & Rich,	E D,	400
P. Auld,	Improved Scotch,	410
Prouty & Mears,	Center Draft, No. 25,	400
Prouty & Mears,	Center Draft, No. 5½,	425
Wm. U. Chase,	Amsterdam, No. 7,	375
A. Fleck,	Wilkie's Scotch,	450
Gilbert,	New Jersey,	575

Our remarks on the special qualities of the several plows have been given with so much detail under the trials on "old land," and on "stiff sod," that we deem it unnecessary to say more in relation to them in the present connection, except the general remark, that the greatest deficiency noticed in most of the plows which were submitted for this trial, was one which would have entitled them to commendation in stiff and tenacious soils, and that is, they lapped the furrows too much, which increased the friability of a soil already too loose. They were also deficient in burying the grass. In most of the lands it could be seen protruding through the interstices, and a shower having occurred soon after the trials were finished, it grew in a few days so as to cover the field with a very undesirable verdure. These defects, however, were admirably obviated by the plows to which the premiums are awarded. All the plows were guaged to work six inches by twelve.

TRIAL OF SIDE-HILL PLOWS.—These plows were tried on a steep side-hill in the same field where the trials on "old land" were made. There were three plows entered for the premium, viz:

Bosworth, Rich & Co.'s ..... price $7 00, weight 123 lbs.
Prouty & Mears', ... 9 00, " 110 lbs.
Eddy & Co.'s, ... 9 00, " 111 lbs.

They all performed well, and are well worthy of their makers' reputations, and of the confidence of the public; but all things considered they esteem the plow of Bosworth, Rich & Co., the best. It is truly an excellent implement, and they recommend it with great confidence to those requiring such an implement, as one which will give them entire satisfaction.

Digitized by Google

TRIAL OF SUB-SOIL PLOWS.—Three plows were entered for this trial, viz:

PROUTY & MEARS' *B Sub-soil Plow.*—Price $10, weight 103 lbs., draft 750 lbs.; in a very stiff hard-pan, filled with stones; sub-soil depth 11½ inches. The draft of this plow in a similar soil, but much more free from stones, was 650 lbs.

PROUTY & MEARS' *C Sub-soil plow*, price $8, weight 89½ lbs., draft 650 lbs.; in a sub-soil similar to that in which B was tried, less stony than the first trial, but much more so than the second one; depth 10¼ inches.

BOSWORTH, RICH & CO.'S *Sub-soil plow*, price $7, draft 650 lbs.; in a sub-soil similar in texture and stones to that in the second trial of Prouty & Mears' B plow, depth 10¼ inches, weight 88½ lbs. On a second trial, its draft was 700 lbs., with a depth of 10½ inches. The adjustment attached to Prouty & Mears' C plow, by which the amount of pulverization may be increased or diminished, according to circumstances, gives it a preference over others, and entitles it to a premium. It is proper, however, to add, that the plow exhibited by Bosworth, Rich & Co., was an excellent implement, and will in most respects, give good satisfaction to purchasers.

MEASUREMENTS OF VARIOUS PLOWS.—Notwithstanding the acknowledged importance of the plow as bearing on the quantity, quality and cheapness of vegetable, and, to a considerable extent, of animal food, little is yet known with respect to its theory. One obstacle to its investigation has hitherto been the want of reliable data. As one contribution to the removal of this obstacle, we subjoin the following measurements of various plows which have been exhibited at the trials:

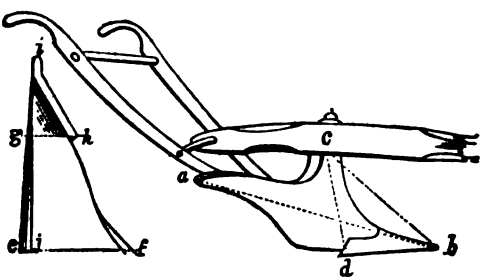


Fig. 2 Fig 1.

Digitized by Google

	Fleck's Scotch Swing Plow.	French & Smith's Sod and Sub-soil	Runderson's Schodack Plow.	Miner & Horton's Peekskill No. 1.	Starbuck & Co.'s Trojan No. 6.	P. Auld's improved Scotch.	Prouty & Mears' Center draft No. 5½	Bosworth & Rich's Iron Beam D.	R. R. Finch's Empire A 3.	H. L. Emery's Albany.	Wm. Chase's Amsterdam No. 2.	Ransom's plow which took the premium at the trial at Southampton, Eng.	Gilbert's New-Jersey.	Starbuck & Co.'s Trojan No. 5.	Starbuck & Co.'s Iron Beam.
Fig. 1 a b,	3 feet 5 in	3 feet 3½ in	3 feet 4 in	2 f't 11½ in	2 f't 9½ in	3 f't 6½ in	3 f't 1 in	2 f't 10 in	2 f't 1½ in	3 f't	2 f't 11 in	3 f't 7½ in	2 f't 7½ in	3 f't ½ in	2 f't 10½ in
" c b,	2 feet 1 in	1 foot 9½ in	1 foot 4 in	1 f't 9 in	1 f't 9½ in	1 f't 9½ in	1 f't 8 in	1 f't 5½ in	1 f't 8½ in	2 f't 8 in	1 f't 10½ in	1 f't 9½ in	1 f't 9 in	1 f't 6½ in	1 f't 5 in
" c d,	1 foot 6½ in	1 foot 6½ in	1 foot 1 in	1 f't	11 in	1 f't 2½ in	1 f't 4½ in	1 f't ½ in	1 f't 5½ in	1 f't 4½ in	1 f't 1½ in	1 f't 1 in	1 f't 5½ in	1 f't 1 in	1 f't 1½ in
Fig. 2 e f,	7½ in	10½ in	9 in	8½ in	9 in	11 in	10½ in	9½ in	11½ in	8½ in	7½ in	9½ in	9½ in	9 in	9½ in
" g h,	5½ in	10½ in	8½ in	9½ in	9½ in	6½ in	10 in	8½ in	10½ in	9 in	10 in	7½ in	10½ in	9½ in	10 in
" i e,	2 feet 9½ in	2 feet 2½ in	2 feet 4½ in	2 f't 3 in	2 f't 3 in	2 f't 4½ in	2 f't 3½ in	2 f't 3½ in	1 f't 4½ in	2 f't 3½ in	2 f't 3½ in	3 f't 2½ in	2 f't 1½ in	2 f't 2½ in	2 f't 2½ in
" e j,	2½ in	1 foot 1½ in	2½ in	1½ in	1½ in	1½ in	1½ in	1 in	2 in	1 in	1 in	2½ in	¾ in	1½ in	1½ in
Ht. Stan'rd	1 foot 5½ in	1 foot 4 in				1 f't ¾	in 1 f't 2½ in		1 f't 2 in	1 f't 3 in	1 f't 4½ in	1 f't 4½ in	2 f't	1 f't 4½ in	1 f't 1½ in

Fig. 1, the line a b is the distance from the extreme end of the point to the extreme end of the mould board.
" " c b is the distance from the point to the intersection of the standard and beam.
" " c d is the distance from the corner of the share to the intersection of the standard and beam.
Fig. 2, " e f is the distance across the sole from the land side to the heel of the mould board.
" " g h is the distance across the sole from the lower side of the corner of the share
" " i e is the length of the sole measured on the land side.
" " e j is the breadth of the land side at the heel.

Digitized by Google

MICHIGAN SOD AND SUB-SOIL PLOW.—We have refrained in the remarks hitherto offered from making any comments on the plow offered by Messrs. French & Smith, and called by them the Michigan Sod and Sub-soil Plow, because in our opinion, it could not be brought into competition with other plows, without great injustice to the proprietors of the latter. In the first place, it is properly a *three-horse plow*, while all the others are two-horse plows. Secondly, its *double* character distinguishes it from all others.

We regard this implement as a most useful present from the mechanic to the farmer, and in our opinion its introduction will effect a great improvement in the tillage of some kinds of soil. It pulverizes the soil in an excellent manner, which to be fully appreciated, must be seen; and it accomplishes this pulverization with an amount of power which, in reference to the work performed, is certainly not large. It buries the sod *completely*, and covers it with a coating of loose earth, which makes a seed bed almost as perfectly as a spade.

In other plows tried, there was *one* size of furrow-slice which the plow turned better than any other; if a broader or narrower furrow was taken, the plow would act less perfectly. This was not the case with the "sod and sub-soil plow; it seemed to perform equally well whatever was the breadth of the furrow, and this quality we deem a great advantage. We do not wish, however, to be understood as recommending this, as a plow adapted to "all work." Where, from peculiar circumstances, it is not desirable to plow deeper than six inches, we cannot recommend this implement; its peculiar pulverizing powers are not fully developed with a furrow shallower than seven inches. Its properties may be given in substance as follows:—

1st. It is particularly useful where *trench* plowing is required; that is, where it is wished to bring the sub-soil, or a portion of it, to the surface. This is a useful operation where the sub-soil abounds with vegetable food in a greater proportion than the surface soil; as on alluvial and other very deep soils, where the upper stratum has been exhausted by cultivation. 2d. It is also exceedingly valuable for ordinary *stiff* adhesive soils, the greatest defect of which is their tendency to pack too closely. This defect is in a great degree obviated by the manner in which this plow performs its work. It cuts its furrow-slice in two parts, horizontally, by which operation it makes twice as much division of the soil as is effected by an ordinary plow when going at the same depth and width, and from the fact that each part is turned over by itself, it falls lightly, and remains in a pulverized state. In consideration of all the circumstances, we recommend that a premium equal to the first, in amount and in honor, be awarded to this plow for "old land" and "stiff sod" plowing.

In view of the results of the trials instituted by us, and detailed above, we recommend the following

AWARD OF PREMIUMS.—To French and Smith, for their Michigan Sod and Sub-soil Plow, for plowing on "Old land" and "Stiff sod." Diploma and $15.

Old Land.—1st Premium to Prouty & Mears, for their Center Draft, No. 5½, Diploma and $10. 2d Premium to Miner & Horton, for their Peekskill, No. 21, $8.

Stiff Sod Soil.—1st Premium, to Prouty & Mears, for their Center Draft, No. 30, Diploma and $15. 2d Premium, to Miner & Horton, for their Peekskill, No. 21, $10.

Digitized by Google

Light Sod Soil.—1st Premium, to Prouty & Mears, for their Center Draft, No. 25, Diploma and $15. 2d Premium, Wm. U. Chase, for his Amsterdam, No. 7, $10.

Side Hill Plow.—To Bosworth, Rich & Co., for their Side Hill Plow, Diploma and $8.

Sub-Soil Plow.—To Prouty & Mears, for their Sub-Soil Plow C, Diploma and $8.

The committee, in making the above awards, would not be understood as claiming *entire perfection* for any of the implements; on the contrary, they believe there is room for improvement in all; their decisions are intended to show, that, of the plows which came under their examination, those on which the premiums were bestowed, were the best for the purposes designated. We would earnestly invite the attention of manufacturers of plows to the necessity of adapting their implements to *special purposes.* It is a great mistake to suppose that the construction of a plow "of all work," as it is called, is possible. The different circumstances under which plows must be used, and the different objects to be attained, render a difference of construction absolutely necessary. For instance, clayey and tenacious soils ought to be thoroughly pulverized, and to effect this, they must be plowed with a deep and narrow furrow, and left as light as practicable. Sandy soils, on the other hand, should be merely turned over, to expose a fresh surface to the atmosphere, and to bury the surface vegetable matter, without pulverizing or making the soil more loose—its lightness being already too great to prevent the escape of the æriform and liquid matters which constitute the food of plants. It may be observed, too, that plows of somewhat different construction are required for rough and smooth land, a shorter implement, especially, being required for the former situation, in order to adapt itself to the inequalities of the surface. It is obviously impossible that the same plow can fulfill such antagonistic conditions; and it therefore becomes necessary to ascertain what are the best plows—not for general purposes—but for the various special purposes to which they must be applied.

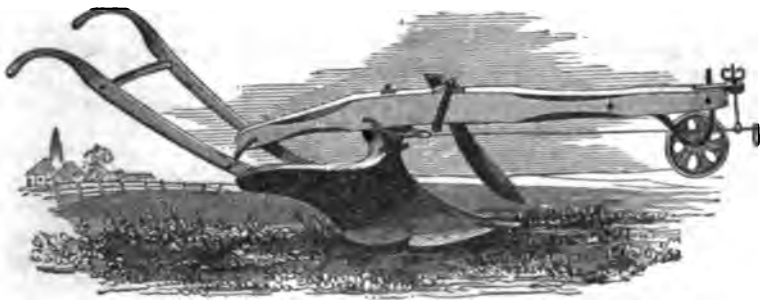
The committee would do injustice to their own feelings were they to fail to acknowledge their obligations to Ezra P. Prentice, Esq., the President of the Society, for his earnest efforts to promote the success of their experiments, by valuable advice and intelligent co-operation. They also desire to express their cordial acknowledgments to B. P. Johnson, Esq., the Secretary of the Society, for his assiduity in anticipating and providing for all their wants during the trials of the plows. Much of the success which has attended their labors, is due to his untiring watchfulness and intelligent zeal.

They also desire to express their thanks to all the competitors, without exception, for their kindness, and for the liberal confidence which they displayed towards the committee during the protracted trials of their implements. To H. L. Emery, of Albany, and Wm. U. Chase, of Amsterdam, their thanks are especially due for active and willing assistance rendered by them on the field.

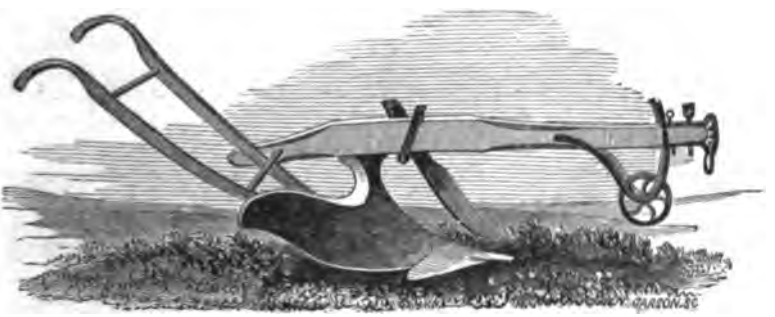
ANTHONY VAN BERGEN,
JOHN STANTON GOULD,
SANFORD HOWARD,
B. B. KIRTLAND,
PETER CRISPELL, JR.,
Committee.

Digitized by Google

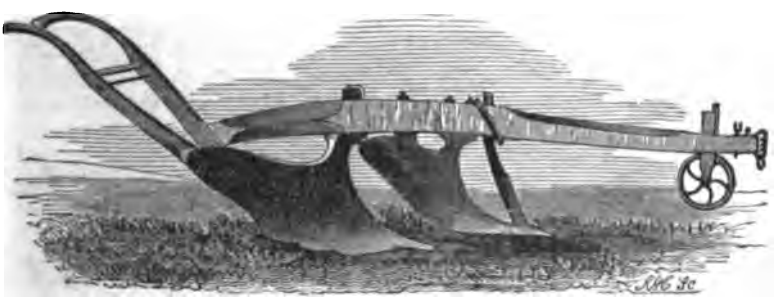
NEW-YORK STATE PREMIUM PLOWS.



PROUTY & MEARS' CENTER DRAFT, No. 5½:
Which received the first premium for fallows and old land.



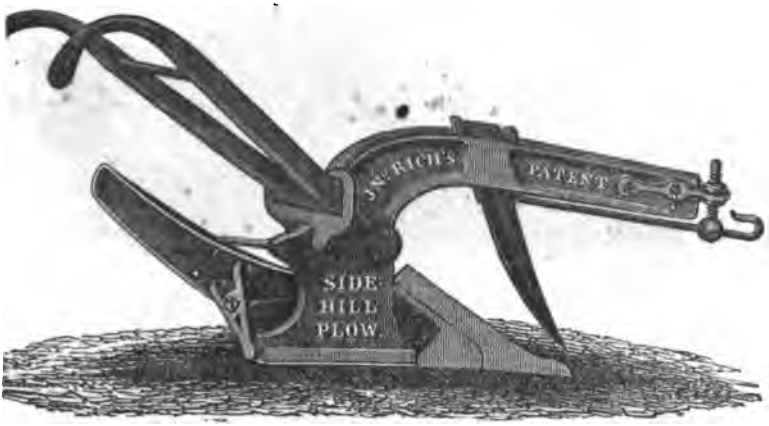
MINER & HORTON'S PEEKSKILL, No. 21:
Which received the second premium for both fallows and stiff sod.



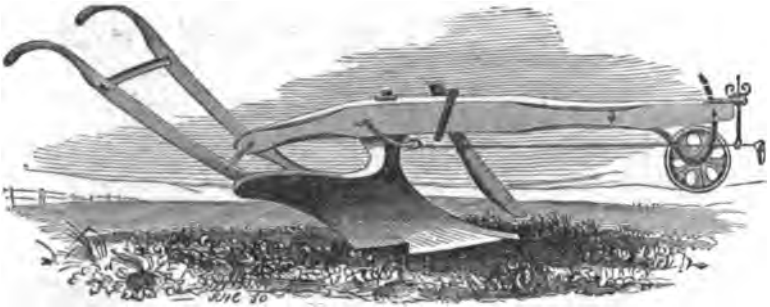
FRENCH & SMITH'S MICHIGAN SOD AND SUB-SOIL:
Which received a special premium for fallows and stiff sod.

Digitized by Google

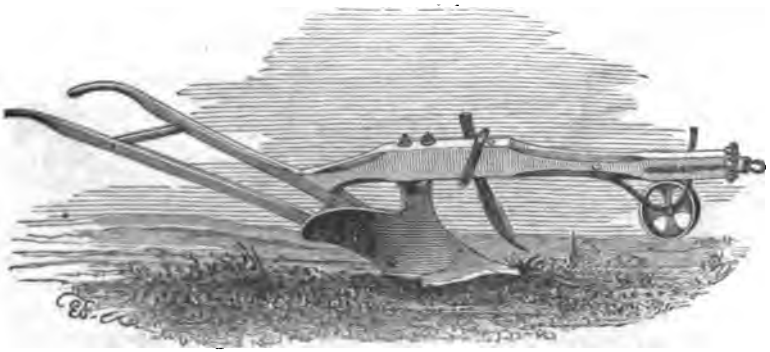
NEW-YORK STATE PREMIUM PLOWS.



BOSWORTH, RICH & CO.'S SIDE-HILL:
Which received the first premium for side-hill plowing.



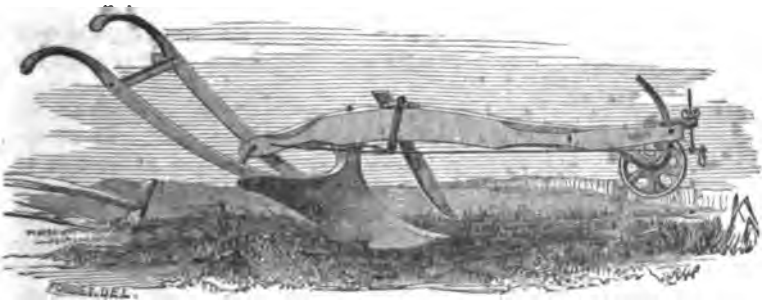
PROUTY & MEARS' CENTER DRAFT, NO. 25:
Which received the first premium for light sod.



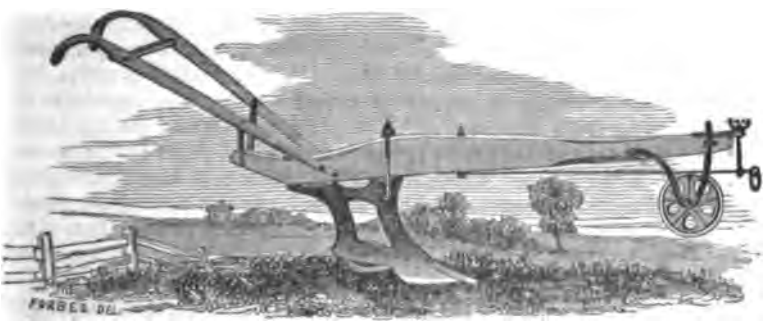
W. U. CHASE'S AMSTERDAM NO. 7:
Which received the second premium for light sod.

Digitized by Google

NEW-YORK STATE PREMIUM PLOWS.



PROUTY & MEARS' CENTER DRAFT, No. 30:
Which received the first premium for stiff sod.



PROUTY & MEARS' SUBSOIL PLOW, C:
Which received the first premium.

POINTS IN THE CONSTRUCTION AND ADJUSTMENT OF PLOWS WHICH REQUIRE THOROUGH EXPERIMENTAL AND THEORETICAL INVESTIGATION.

The committee were not unmindful during the trials, of the necessity and desirableness of settling some of the mooted questions in relation to plows and plowing, and they endeavored as far as they were able to make the tests which they applied, subservient to the elucidation of these. But it was found that this could not be done satisfactorily amid the pressure of their other business.

To do justice to the specific questions which the Society assigned to them for solution, it was necessary for them to concentrate all their attention and sagacity on these alone.

The committee therefore earnestly recommend to the Society to institute trials in the months of May or June in each year, for the thorough investigation and solution of the following questions, until they are all finally settled.

These experimental investigations require great patience, as every one is aware who has attempted them, and should the Society adopt our recommendation in this respect, it is hoped that great care will be exercised in the selection of the committee to superintend the trials. It should be composed of men who will patiently multiply and diversify the experiments

Digitized by Google

until every source of fallacy is removed, and every shadow of doubt is dissipated from their conclusions.

1st. What is the proper depth for the coulter to run into the earth, and what is the proper angle for it to make with the beam in order to make the best work and the easiest draft?

Your committee made several trials to ascertain the proper depth for the coulter to enter the soil in order to secure the easiest draft. In all the trials, it appeared that the nearer the coulter was brought to the sole of the plow, the easier the draft became, but the numerical expressions of this difference varied so widely and capriciously, as to diminish our confidence in the results attained. We found also, so far as our investigations extended, that the ease of draft was in some degree proportioned to the acuteness of the angle made by the edge of the coulter with the beam, but our experiments were not sufficiently thorough to establish the law.

2d. What is the influence of the wheel on the action of the plow and on the draft?

The question has long been a disputed one among practical farmers, especially between the Scotch and English plowman, and many experiments have been made from time to time to determine the question, but these have been generally instituted by heated advocates or opponents of the wheel, and have been conducted more with reference to the establishment of a foregone conclusion, than with a candid and single eye to the establishment of the truth. We were unable from any of our experiments to cast any light on the question, except that in every case where plows were used without wheels, the draft was much greater than when they were used. It is possible, however, that this may have arisen from the imperfect adjustment of the swing plows.

3d. What is the law which regulates the relation between draft and depth of plowing?

A carefully constructed table, which would show the surface draft of a plow; its draft plowing three inches deep, and its draft for every additional inch up to twelve inches, would not only be very useful to farmers, but to committees charged with the duty of investigating the draft of plows, it would be invaluable; as it is often found, that on these trials the depth of the furrow will vary almost an inch in spite of every effort to prevent it. And it is very difficult in the present state of our knowledge; for any committee to make the proper corrections, so that the indications of the dynamometer shall show the exact comparative merits of each plow working under *the same circumstances.*

4th. What is the influence of the weight of the plow on the ease of draft?

The rule given in some standard treatises of plows for ascertaining the draft of two plows of unequal weights is, deduct 7 lbs. of draft from the heavier plow for every 14 lbs. of its excess in weight. Thus, if each of two plows are found to mark 400 lbs. on the dynamometer, and one plow weighs 100 lbs., and the other 128 lbs.: then, since one weighs 14 lbs. more than the other, twice 7 lbs. must be deducted from its draft; the draft of the light plow will then stand at 400 lbs., and that of the heavier at 386 lbs. But this rule so far as we can discover stands on the basis of no reliable experiments, and we have not felt justified in applying it as a correction of our own results. We deem the question a very important one, and hope that it may be satisfactorily settled.

5th. What is the influence of speed on draft?

Digitized by Google

It is well known that in ordinary cases the resistance increases as the square of the velocity. It is deemed of much importance to ascertain whether the law holds good in relation to plowing.

7th. What is the influence of the *beam* in plowing? What is the effect produced by the increase or diminution of its length, on draft, on the ease of management and on the quality of the work performed?

8th. In what ratio is the sum of power required for plowing, distributed among the various parts of a plow, *i. e.* what proportion is required for turning the furrow over? what proportion for separating the cohesion of the slice on the land side? what proportion in overcoming the cohesion at the bottom of the slice? and what proportion is expended in friction.

The Mode of Conducting Trials of Plows.

Much of the success of trials of plows, much of the accuracy of the results arrived at, depends upon the thoroughness of the preliminary preparations and arrangements. Many small implements and contrivances are required upon the ground, which are rarely thought of before the necessity for their use arises. When the trials are in progress, and numerous competitors who remain at a considerable expense, are impatiently awaiting their conclusions, there is a constant temptation to hurry on, and if the *right* thing is not at hand, to substitute something in its place which will *answer* to get along with, but which does not answer a good purpose. Where a number of these imperfect substitutions are made, the sum of their action materially influences the accuracy of the result, and what is still worse they harrass the judges and disturb that perfect calmness of mind which is so necessary, for that quick and accurate observation so essential for the proper discharge of their functions.

In order to aid the society in the prosecution of subsequent trials of a similar nature, and also to furnish a guide for other societies, which without having previously done so, are desirous to co-operate with us in the thorough testing of plows, we have deemed it our duty to describe all the minutiæ of the preparation for such trials, and the mode of conducting them in the field, satisfied that our successors at least, (whatever may be the case with others,) will not accuse us of undue tediousness in the narration.

1st—The Selection of the Land.

In preparing for a trial of plows, the first thing is to procure a place where fields of a proper description can be found. In the selection of the place the following points should be kept in view:—1st. The fields should be as nearly contiguous as possible, in order to obviate the expense and loss of time of moving the teams and implements from one place to another, and to enable the judges to make comparisons with more ease and thoroughness than they could do if the lots were more remote from each other.

2d. The fields selected should be in the vicinity of some convenient tavern, where the judges—the competitors and their teams can be comfortably accomodated.

3d. The fields should be large—much larger than the necessary area of the lands plowed under the inspection of the committee, because it is necessary that the competitors should be allowed a considerable space to temper or try their plows, and adjust them to the soil and the prescribed size of the furrow; when this is done sufficiently they can plow the trial

Digitized by Google

land without any stoppages for adjustment, and the judges can then observe the action and draft of the implement much more satisfactorily to themselves and to the competitors.

4th. The land in each field should be uniform. This is a condition of great importance, yet exceedingly difficult to fulfil. If one competitor draws a land at the bottom of a valley it will probably be more stony, more wet, and covered with a ranker herbage, than if it were on a plain, it will therefore cause a heavier draft, leave a more broken and rugged surface and bury the grass less perfectly than if it had been a plain. In such cases it is difficult for the judges to make a due allowance for the impediments, and it is very possible the more perfect instrument may thus lose its just meed of commendation. Too much attention cannot, therefore, be given to this circumstance in the selection of fields.

5th. The soils should be rather extreme specimens of their respective classes. It would be preferable that "old land" should be stony and stiff; "stiff sod" should be the stiffest clay and the toughest sod; "light sod" should be the loosest sand. Difficulties and obstacles bring out in bold relief the excellencies of a good implement and disclose the defects of bad ones with the greatest clearness. The more natural difficulties exist in a field the better is it adapted for this purpose, provided these difficulties are *evenly* diffused over the surface.

2D—IMPLEMENTS TO BE PROVIDED.

1st. A dynamometer, one working in oil is to be preferred, which checks rapid vibration.

2d. Two common hooks, as in the figure

Two small swivel hooks, Two hooks,

Two small clevys.

3d. Twelve poles, 8 feet long, 1¼ inches diameter, sharpened at lower end, painted white for 2 feet from the top, and a ring of black 6 inches broad, painted 1 foot below the top; these poles are to assist the plowman in drawing the furrows straight, and the black ring on the white ground is to enable him to distinguish it readily from surrounding objects.

4th. Eighty pieces of inch board, 2 feet long and 3 inches broad, sharpened at one end and rounded at the other. On the rounded ends of these boards should be painted numbers from 1 upwards, according to the number of plows entered for competition, these boards are placed at the corners of the lands which are designated by the number on the board. Eighty common rough stakes should also be provided, as they are frequently needed, and the want of them often causes much trouble and loss of time.

5th. A platform balance for weighing the plows.

6th. A tape line 100 feet long; a two foot rule, and a tape line 8 feet long, for each of the judges.

7th. A windlass furnished with a grooved wheel at least 12 inches in diameter, and a crank at each end; a rope (hawser size) 100 feet long; an axle 22 inches between the wheels, the two wheels to be two feet in diameter on the land side, and three feet diameter on the furrow side; the tongue attached to the axle should be 4½ feet long, with a ring an inch in diameter

Digitized by Google

fastened near the end; a crow bar, an axe, and 3 or 4 large stakes. These implements are for the trials of draft by hand power.

8th. An Iron Guage, (fig. 1,) to be attached to the beam of the plow to show the width of the furrow taken, and a Wooden Guage, (fig. 2,) to show the depth and breadth of the furrow taken.

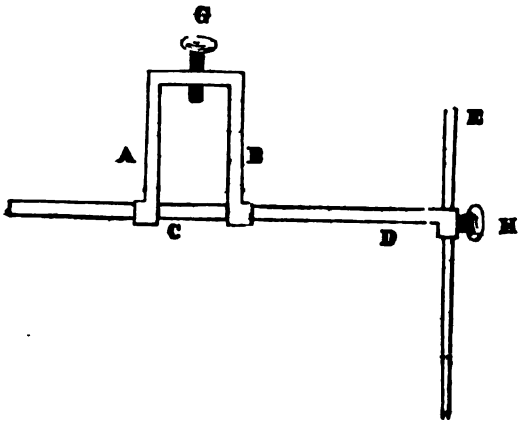


Fig. 1.

A B is a clevis placed upon the beam opposite the edge of the coulter. C D is a bar running horizontally through the lower part of the clevis, beneath the beam, and can be moved at pleasure. E F is a flat rod passing perpendicularly through the end of the bar C D, and can be raised or lowered by the thumb-screw H. The point F is placed immediately over the edge of the land. The distance C D regulates the width of the furrow to be plowed, and can be set to any required distance, by loosening the thumb-screw G, which secures the instrument upon the beam of the plow.

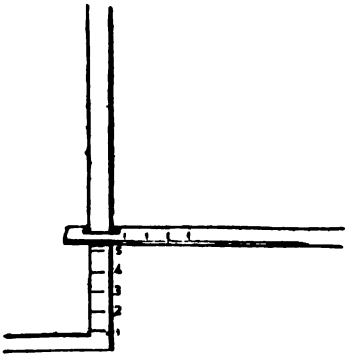


Fig. 2

3d—Officers and Laborers.

1st. It is important to have an active, energetic peace officer, to keep spectators off the ground which is being plowed, and to preserve order generally.

2d. One man should be engaged, who should have charge of all the implements, and have them in readiness when required; he should also attach and detach the dynamometer as often as may be necessary.

3d. One man should be employed to assist in staking out the lands, in setting up the sight poles, and in carrying messages from the judges in various parts of the field.

4th. Two good plowmen should be employed to hold the plows of such competitors as are not provided with plowmen.

4th—Teams.

One pair of large, steady horses should be procured, and no other team should be employed while the dynamometer is attached to the plow.

Two other teams should be employed, for the use of such competitors as are unprovided with teams, to get their plows into working order, preliminar to the final trials.

Digitized by Google

A lumber wagon should be procured, with one of the teams to transport the plows from one place to another.

5TH—COMPOSITION OF COMMITTEE.

It is desirable that the committee of judges should consist of at least five persons. One of these should be a scientific and practical mechanic, in order to judge of the workmanship, strength of material, &c., of the plow. Another should be a thorough mathematician, who should investigate its theory, and the remainder should be practical farmers.

6TH—RULES.

The society holding the trial, should prescribe the rules by which the premiums will be awarded, in time for the competitors to become thoroughly acquainted with them before the trial, they should be printed on slips and one should be given to each competitor at the time of entering his plow. The rules established for premiums at the present trial have been found to be all that is necessary, and we cannot recommend any change in them for future trials.

7TH—MODE OF PROCEEDING OF THE JUDGES.

Every person selected as a judge should be promptly at his post at the day and hour prescribed for the commencement of the trials.

1st. They should distribute their duties. The chairman should keep all the minutes of the trials. One member should be charged with staking out the lands, another to attend to the dynamometer indications, another to examine the width and depth of the furrows, another to note the time occupied in plowing each land and the time occupied in plowing each furrow while the dynamometer is attached. One person should be appointed to weigh the plows, and another to take such measurements of each plow as will serve to identify its peculiarities. These will be found to embrace all the duties which will be required from the members of the committee.

2d. The judge who has been detailed to stake out the ground with the assistance of the man hired for the purpose, will now proceed to lay off the land into sections of 23 ft. by 150 ft., leaving a space of six feet in width between each section, in order that the boundaries of the land plowed by each competitor may be distinctly marked.

While the land is being staked off, the plows should be weighed and measured, and the chairman should prepare number of pieces of paper, numbered from one upwards, and the number drawn by each competitor will designate the number of the section which he is to plow. The chairman will keep a memorandum of the drawings.

3d. When all the sections are staked out, and also a piece of ground thirty feet wide for windlass trials of draft, the competitors may use the unoccupied portions of the land to get their plows in order for the trials.

4th. When a competitor is ready for the trial of his plow, he should announce it to the judge who keeps the time, who should make a memorandum thereof. When he has made the back furrow and two additional furrows, the dynamometer should be attached, and the judge having the matter in charge, should then note the indications four times in each furrow, for six furrows, making twenty-four observations; when he has averaged these, he should report such average to the chairman, who will make an entry thereof. While the dynamometer is attached, the judge should observe the time of plowing each furrow and report the average time to the chairman. One of the judges should measure the furrow slices four times in

Digitized by Google

each furrow, making twenty-four measurements in all, the average of which he should report to the chairman.

5th. When the land is finished, the plowman will report to the judge who keeps the time, who will report the whole time occupied in plowing the land to the chairman.

The chairman's minutes will then show the name of the competitor; the name of the plow, and the number or letter that distinguishes its size; the number of the lot plowed; the draft; the size of the furrow slice; the time occupied in plowing the draft test furrows, and the time occupied in plowing the whole land. Each judge should be furnished with a memorandum book, in which he should note anything worthy of notice that occurs to him in the action of the plow, the character of the soil, or the skill of the plowman, or the results of the work.

Many of these observations may seem minute and trivial, but we are satisfied that they are all important, and that none of them can be dispensed with without inconvenience, and that a rigid adherence to them will add much to the satisfaction which the society instituting the trial will derive from the results.

ANTHONY VAN BERGEN,
JOHN STANTON GOULD,
SANFORD HOWARD,
B. B. KIRTLAND,
PETER CRISPELL, Jr.
Committee.

Plowing Match.

Judges.—R. Van Dyke, Greene co., chairman; Joseph Beach, Keeseville; Peter H. Brink, Ulster co.

1. S. G. Smith, Stillwater, Saratoga co.; ox team, Trojan plow, L. B. Smith, plowman, $10. 2. John Randerson, Schodack; Randerson plow, J. Randerson, plowman, $8. 3. Newell French, Rome, Oneida co.; Michigan plow, Thomas Williams, plowman, $5. 4. Eddy & Co., Union village; Washington co. wrought iron beam plow, James McDougal, plowman, Trans.

C. M. Warren's Grass Hopper plow, did the work equally as well as Eddy & Co.'s, with the exception of depth.

Farm Implements, No. 1.

Judges.—William Buel, Rochester, chairman; Roswell Reed, Coxsackie; Hugh C. Wilson.

Best farm wagon—Christopher Snyder, West Sandlake, Rensselaer co., $5.

Best harrow—J. & R. Downer, Castleton, Rensselaer co., $3.

Best corn cultivator—Emery & Co., Albany, $3.

Best fanning mill—I. T. Grant & Co., Schaghticoke, $5.

Best corn stalk cutter—Reuben Daniels, Woodstock, Vt., $5.

Best straw cutter—Wm. Hovey, Worcester, Mass., $3.

Best corn and cob crusher, by horse power—Emery & Co., Albany, $5.

Best one horse spring cart—Matthew O'Brien, Albany, $3.

Best horse rake—R. H. Chase, East Livermore, Maine, $2.

Best ox yoke—Emery & Co., Albany, $2.

Discretionary.—Oscillating roller axle, a new and valuable improvement—S. Hosack Mix, Schoharie; diploma and small silver medal.

Digitized by Google

The oscillating roller axle is an improvement in carriage wheels, and consists in throwing the weight of the load, and application of the draught *out of the dead center*, as it is called, thereby making the weight of the load to assist in propelling itself, and obtaining a greater lever on the wheel by a direct draught. A heavy wagon with the above improvement, was exhibited on the ground during the Fair, and the ease with which it was moved, excited the admiration of all who examined it. It will doubtless be generally adopted, and must prove a valuable improvement.

Heavy road wagon—Gardner Mix, Schoharie co., Small silver medal.

One or two seated carriage—Long & Silsby, Albany, Silver medal.

Miller's patent one horse sleigh—Miller & Skinner, Fort Ann, Wash. co., Small silver medal.

One barouche, 1 open buggy—Lown & Bunker, Troy, Silver medal.

One Lawrence coach, one covered sleigh, one open two seated sleigh, and one horse sleigh—James Goold & Co., Albany, diploma and Silver medal.

One omnibus—Eaton & Gilbert, Troy, Small silver medal

Roller for general use—Emery & Co., Albany, $5

Miscellaneous articles for general and gardening purposes—Emery & Co., Albany, Silver medal.

FARM IMPLEMENTS, No. 2.

Judges.—Henry W. Bishop, Lenox, Mass., chairman, Austin Sexton, Schoharie; Daniel D. Kendall, Berkshire, Mass.

Best double harness—Lyman J. Lloyd, Albany, Diploma.

Best single carriage harness, with gold mountings, of exquisite workmanship, all the materials of American manufacture, designed for the World's Fair—Lyman J. Lloyd, Albany, Silver medal.

Best churn, thermometer churn, compressing dash—Emery & Co., Albany, $2.

Best cheese press—Hezekiah Rodgers, Clifton Park, Saratoga co., $2.

Grain cradle—Nichols & Boley, Van Buren Center, Onondaga co., $2.

Best six hand rakes—David Ray, Chatham, Columbia co., $2.

Four garden rakes of very superior merit—S. C. Blair, Farmington, Ct., diploma.

Six hay forks—D. J. Millard, Paris, Oneida co., $2.

Six straw forks—D. J. Millard, Oneida co., $2.

Six Grass scythes—D. J. Millard, Oneida co., $2.

Six cradle scythes—D. J. Millard, Oneida co., $2.

Six manure forks—D. J. Millard, Oneida co., $2.

Hay rigging—Wm. P. Coonradt, Brunswick, Rensselaer co., $2.

Discretionary.—A lady's saddle—L. J. Lloyd, Albany, Diploma.

Patent shaftoe saddle—E. B. Slason, Albany, Diploma.

Grass scythes and snathes of very convenient construction—Draper, Brown & Chadsey, Troy, $2.

Butter ladles and prints—St. Paul Seely, Morris, Otsego county, $2.

Shovels and spades—Emery & Co., Albany, $2.

Potato Diggers—Henry Partridge & Son, Medfield, Mass., $2.

Cast steel hoes of superior workmanship—S. P. Reynolds, Unadilla Forks, Otsego county, $2.

Drawing knives, worthy of particular notice, superior to any ever seen by the committee—Emery & Co., Albany.

Digitized by Google

The exhibition of implements falling within the above division was exceedingly satisfactory. The skill and ingenuity displayed, were such as to furnish constant gratification to the committee, and gave great relief to their arduous and somewhat perplexing labors. It is impossible in a brief report to give a full description of all the articles presented, each of which is worthy of particular notice. They evince progress in this important department of industry. It is by the hand of man that finish and polish are given to cultivated fields and gardens, and improvement in the construction and easy use of the implements employed, is a matter of no inconsiderable moment to the operator.

No "plow or wagon harnesses for farms" were exhibited. This omission your committee regret, as some of them are aware that improvements have been made in harnesses of this kind, which, if generally known, would be of much benefit.

Churns.—A great number of churns were exhibited, differing in principle and modes of operation. We examined none which was not well suited to its purpose. They were all good, and the dairyman, unless he could have an opportunity to settle the question by experiment, would be exceedingly puzzled in making a selection. After a careful examination, however, we came to the conclusion (a conclusion which we are not entirely prepared to say does justice to the other competitors,) to award the Society's premium to Messrs. Emery & Co., Albany, for their thermometer churn with compressing dash.

Farm Implements, No. 3.

Judges.—John Stanton Gould, Columbia; John McDonald, Washington.

The committee respectfully report, that their attention was first directed to horse power, on the *sweep or lever principle.*

I. Three implements were offered for examination and adjudication, viz: H. E. Smith's lever iron horse power, price $105, four arms; H. Warren, Bogardus patent, price $100, two arms; Eddy & Co., Union village, price $100, circle.

The points in a good thrashing machine, in our opinion, are as follows, and the one possessing the *greatest* number of them ought to receive the premium: 1st. Strength and durability; 2d. Ease of draft; 3d. Cheapness and facility of repair; 4th. Ease of transportation; 5th. Simplicity of structure; 6th. Equability of strain on each horse; 7th. Facility for stopping and starting.

We consider the three machines equal on the 1st, 4th and 5th points, and that portion of the 3d which relates to cheapness, Smith's and Eddy's are equal in the 7th, but Eddy & Co.'s are superior in the 2d, 6th and that part of the 3d which relates to facility of repair, and therefore we award the premium to them, $5 and Diploma.

II. Horse power on the *railroad* or *endless chain* principle.—Four machines were entered, as follows: A. B. Allen, & Co., railway horse power, price $100; J. Ham, railway horse power, price $95; Emery & Co., railway horse power, price $105; Wheeler, Melick & Co., railway horse power, price $105.

We award the premium to Emery & Co., $5 and Diploma, on the ground of their superior strength and durability, they have also an arrangement for tightening the endless platform, which is peculiar to them, and in our opinion greatly enhances the value of the machine; the converge wheel can be made

Digitized by Google

to work on either side of the machine, and altogether it presents the greatest combination of excellencies of any machine that has ever come under our notice.

III. Thrashers to be used with *horse* or *steam* power.—Emery & Co., price $35; J. Ham, price $45; Wheeler, Melick & Co., price $45; A. B. Allen & Co., price $40; Eddy & Co., price $40.

Eddy & Co.'s thrasher is constructed of separate iron rings 11 inches in diameter, each ring has two beaters made of wrought iron 2 1-8 inches in length, the interval between the beaters of the cylinder and those of the concave is 3-8 of an inch. It is furnished with an *elastic* sheet iron apron, the concave works on a hinge, and may be raised or lowered at pleasure, the pully may be used on either side of the machine; the box fastens with a spring catch. There is less liability to breakage in the teeth of this machine from their shape and mode of insertion, than any with which we have compared it; it is more easily repaired, more convenient and efficient in working, and altogether more adapted to the purposes of the farmer than any that we have seen, and we award to it the premium of $5 and a Diploma.

IV. Seed planters.—Emery & Co., Bachelder's corn planter, price $15; John P. Groshen, price $25; Joshua Woodward, price $20.

The seed planter exhibited by J. P. Groshen is as simple in its structure, and as easily kept in repair, as any we have seen, and appears to be *better* adapted to all the purposes for which such an implement is required than any other; by an ingenious arrangement the number of hills can be increased or diminished with great facility, it shuts off the supply of grain at pleasure while the wheel is travelling, which is very convenient while passing over an head-land and prevents the waste of seed; the provision for furrowing and covering is ample, and the roller which follows presses the earth around the seed in a manner best adapted to ensure its germination. We award him a premium of $3 and a Diploma.

V. Grain drills.—Foster, Jessup & Co., price $55; J. H. Atkins, price $70; Bickford & Hoffman, $65; P. Seymour, price $80 with nine teeth. $70, with seven teeth.

Seymour's combined grain drill, seed planter and broadcast sower, is a most complete and valuable implement; its chief excellence consists in its adaptation to sowing seeds which have been soaked and rolled in lime and plaster, its operation with such seeds is very satisfactory. The seed drops from the box to the tubes in sight of the operator so that he can be always sure that the work is really done; the teeth are all raised from the ground and the seed stops at once, or one of them may be raised alone, and the seed running to it may be arrested with equal facility. We have no hesitation in awarding him a premium. Diploma.

VI. Broadcast Sower.—P. Seymour, diploma. No competition.

VII. Wheat Cultivator.—T. Root, price $20; E. Sweet, $30.

The implement exhibited by E. Sweet appears to us as nearly perfect for the purpose intended to be accomplished, as any we have ever seen; the workmanship was excellent, made of durable materials, and in every respect is an excellent machine. Diploma.

VIII. Portable Saw Mill.—Emery & Co., wood saw, $35 to $45; cross-cut saw, $35. Wheeler, Mellick & Co., price not ascertained. Premium to Emery & Co. Diploma.

IX. Corn Shellers.—Hand and horse power. We award the premium for corn shellers to Emery & Co. Diploma.

Digitized by Google

X. Vegetable Cutters. Emery & Co., $12; V. H. & N. Hallock, $10, W. Avery, $5 to $8.

The machine of V. H. & N. Hallock is undoubtedly the best, cutting the roots into smaller pieces, with less trouble than any other, and not liable to get out of repair; we therefore award it the premium. Diploma.

XI. Best and most numerous collection of Agricultural Implements.

XII. Best and most numerous collection of Implements made in the State of New York.

We award the premiums, $20, diploma and medal, for these two classes, to Emery & Co., and at the same time, in justice to this enterprizing firm, we desire to express our unqualified admiration of the unequalled excellence of the exhibition. In variety and excellence of the implements exhibited, it is believed that their show has never been surpassed at any show in the United States; most certainly it has never been equalled by any show under the auspices of this Society.

In conclusion, your Committee would remark, that the number of articles submitted to their examination has been altogether greater than the time allotted would allow them to investigate with that thoroughness that is desirable.

It is believed that it would be advantageous to the agricultural community, and to exhibitors, to have one committee who should devote their attention solely to thrashing machines and horse powers. Every year these implements are becoming more and more essential to the farmer; and as the cost of one is considerable, and as farmers are very much dependent on the representations of the makers, who are not always guided by disinterested motives in their recommendations, it seems very desirable that the Society should make a thorough comparative examination of the various machines in use, so that their decision should prove a guide to farmers in their selections, from which there could be no appeal.

Competitors should be required to furnish a sufficient amount of sheaves of oats and wheat to exhibit the action of their machines. The power required to thrash a given number of bushels in a given time should be ascertained by the dynamometer, and every point connected with the machines should be thoroughly investigated.

Machinery and Implements.

Judges.—Robert Denniston, Montgomery, Orange co., chairman; John Rodgers, Albany.

Sliding cut-off valve for steam engine—S. P. Winne, Albany; Silver medal.

Brick moulding machine—Baker & Gifford, Troy; Diploma.

Dairy steamer—Harry Bushnell, Utica; Diploma.

Two corn stalk and straw cutters, patented Sept. 11, 1849—Edward & Thomas Burrall, Seneca, Ontario county; Silver medal.

Three cylinders of knives, of different construction, for straw cutters—Wm. Hovey, Worcester, Mass.; Silver medal.

Two of King's railway washing machines—Vantuyle & Coons, Lansingburgh; Diploma.

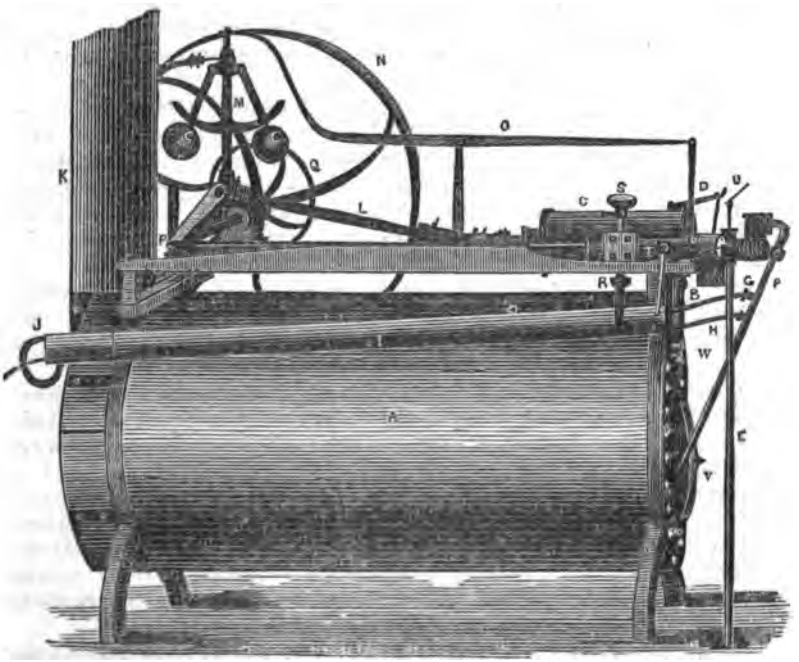
Spring tooth harrow, attached to broad cast sower—S. S. Sage, Windsor, Broome county; Diploma.

Grain and seed sower, with plow attached—Samuel Davison, Greece, Monroe county; Diploma.

Digitized by Google

Steam engine for agricultural purposes on the farm. Hoard & Bradford, Watertown, Jefferson county; $25 and silver medal.

HOARD & BRADFORD'S PORTABLE STEAM ENGINE.



A Boiler. B Steam pipe from the boiler to the cylinder. C Cylinder. D Safety-valve, lever and weight. E Water pipe leading to the pump. F Water pipe from the pump to the boiler. [This pipe is closed between G and H, so that the water is made to pass through the heater I.] G and H Pipe carrying the water through the heater. I Heater. J Pipe carrying the steam from the heater into the smoke pipe. K Smoke pipe. L Connecting rod. M Governor or regulator. N Fly wheel. O Bar connecting the throttle-valve and governor. P Eccentric crank, to work the steam-valve. Q Driving pully on the main shaft. R Pipe conducting the exhaust steam from cylinder to heater. S Cup for oiling cylinder. T Steam gate. U Air-cock connecting with the pump. V Fire door. W Guage-cocks.

PRICES.—½ horse power, $75; 1 horse power, $110; 2 horse power, $160; 3 horse power, with cut-off, $250; 4 horse power, with cut-off, $325.

W. F. Ketchum's patent mowing machine—G. W. Allen & Co., Buffalo; Diploma.

Sanders' winnowing machine—Albert Bates, Shanesville, Ohio; Silver medal.

Quack rake and sod cutter—S. Cheever, Bemis Heights, Saratoga county; Small silver medal.

Wm. Croasdale's seed drill—Wm. H. Carr, Philadelphia; Diploma and Small silver medal.

Digitized by Google

Myers' patent water filterer—Gideon Myers, Rockton, Herkimer county; Diploma.

Patent dog power for churn—Bosworth, Rich & Co., Troy; Small silver medal.

Patent for connecting and disconnecting wheel hubs and axles—Billings & Ambrose, Claremont, N. H.; Silver medal.

Several articles entered in this class were not found by the committee after diligent search.

Weigh-lock for canals—E. & T. Fairbanks & Co., St. Johnsbury, Vt.

The drawing of another weigh-lock was exhibited by Messrs. Duryee, Forsyth & Co., of Rochester. Mr. Fairbanks wished the committee to examine his lock at Albany, while Messrs. D. & F. stated that their lock was in successful operation at Rochester. The committee being unwilling to pass upon the merits of these weigh-locks by examining the structure of one party and the mere drawing of the other party, concluded to waive the question, believing that the State authorities having charge of the canals would do the articles full justice.

Hoard & Bradford's Portable Steam Engine

At the time of the Fair, a full description of the engine and its construction and advantages were not presented—but were subsequently furnished to the Executive Committee and are annexed—and the engine delivered at the agricultural rooms:

Description.—The engine represented by the above cut, has been invented and constructed with a design to its substitution for hand labor in many of the branches of agricultural and mechanical labor. To the more general application of steam power in these departments of industry we may look for an important change in the amount and economy of production.

The most common objections urged against its use are: the liability to explosion—danger of fire—difficulty in operating.

To obviate the first, they are all made of the *best* American boiler plate, and strong enough to bear from three to four or five times the pressure at which they are weighted. The boiler is so constructed as to present a large surface at the water line, and the water is not subject to sudden depression below the fire line. The fire place will not contain wood enough at once to reduce the water from the water line to the fire line: if, therefore, there is water sufficient in the boiler when the fire is replenished, *that* fire would cause no danger, if the pump should fail to work.

To remove the second objection, the exhasted steam is carried into the smoke pipe, which so effectually destroys the sparks that it has been found impossible to fire a handful of straw or shavings laid on the top of a smoke pipe ten feet high.

We remove the other objection by simplifying the machinery and sending with each machine printed directions for its management.

These engines are strictly *portable* and can be as conveniently removed from place to place, and set up as readily as a common stove.

They are applicable for every purpose where power is required. From one-tenth to one-fourth of a cord of wood per day will be sufficient to run the various sizes up to four horse power. A two horse power with machines adapted to it would be large enough for most individuals for farm purposes, but one of three or four horse power would do the work for six or eight neighbors.

Digitized by Google

In the mechanic's shop where power is more frequently required, the utility of these engines is more obvious. In winter they will answer the purpose of a stove, and with the consumption of the same amount of fuel that would be used in a stove, a convenient and effective power is obtained. The house joiner finds them peculiarly adapted to his business, and experience has demonstrated that three or four joiners with one of these engines in a building can finish it as quick as six or seven could by hand labor, and save the most laborious part of the work.

BUTTER.

Judges.—J. H. Carll, Suffolk, chairman; James Cantine, Ulster; H. C. Bush, Lewis.

25 lbs. made in June.—1. D. H. Cary, Albany, $10.—2. Douw Fonda, Perth, Fulton county, $5.—3. Joseph Cary, Albany, Transactions.

50 lbs. made at any time.—1. Joseph Cary, Albany, $15—2. Philip Lasher, Saratoga county, $10.—3. Jonas Lasher, Saratoga county, $5. 4. James P. Noxon, White Creek, Washington county; Transactions.

Butter made by girls under twenty-one years of age.—1. Catharine Lasher, Saratoga county; Silver milk cup.—2. Henrietta Coons, Brunswick, Rensselaer co.; pair Silver butter knives.—3. Abbey C. Hall, New Lebanon, Columbia co.; Silver tea spoons.

Coarse salt —1. E. Clark & Co. Syracuse; Diploma.

Ground solar salt—1. J. P, Haskin, Syracuse; Diploma

STATEMENTS.

D. H. & Joseph Cary's manner of making.—The milk is set in tin pans in cellar, from 24 to 36 hours; particular attention is given to it, so as to skim it as soon as it commences to thicken; it is then churned in a dash churn, by dog power, and usually occupies 30 minutes in churning; when separated, it is taken out with a ladle, and worked with a ladle through cold, hard water, (which is preferred to soft water,) until there is no appearauce of milk remaining. It is then salted, the salt thoroughly worked in, at the rate of three-quarters to one ounce of Ashton salt to the pound of butter. No other substance used. It is then placed in the cellar over night, slightly worked in the morning, and packed for market. Covered with a clean cloth, and with dry salt to keep out the air. Pastures are up land, principally clover and timothy.

Douw Fonda's statement.—Residence in the town of Perth, Fulton co., N. Y. Occupy 120 acres of land, of which 100 is under improvement, the remainder is wood land. The soil is a mixture of clay and loam, subsoil is clay. The number of cows kept is ten. Their keeping in winter is good hay and stalks, in summer, nothing but pasture, consisting of clover, herds-grass, and red top, with a change of lots, thereby always keeping them new; always having access to salt and water. The amount of butter that I sell, exclusive of family use through the season, is about 900 weight.

Treatment of milk.—The milk is strained in shallow tin pans containing from 7 to 8 quarts each; then placed in a clean, cool cellar, for the cream to rise. The time required in ordinary weather, is about 36 hours. It is then fixed for the churn, and the operation is prepared. The butter is then taken from the churn, and thoroughly washed in cold spring water, until the buttermilk is all out, and the water clear. It is then salted to suit the taste, and set aside until sufficiently hard to work, which must be done three times to have it right. The salt I use is the Liverpool fine

Digitized by Google

blown sack salt, salting to suit the taste, and working it by the pressure of a wooden ladle. It is then put in firkins by layers, until they are filled, and covered with a clean cloth, and some salt to keep the air from it, and headed for market.

Girls under 21 Years of Age.

Catharine Lasher, Saratoga, under 14 years of age. The butter made from the milk of 15 cows; divide the time of milking as nearly as convenient; 6 o'clock A. M., and from 6 to 7 P. M. The milk is set in tin pans in cellar, from 24 to 36 hours; and is skimmed and churned in a dash churn; washed with cold well water, to free the butter from milk, worked twice before packing, using from three-quarters to an ounce of Ashton salt to the pound.

Abbey C. Hall, New Lebanon.—The sample of butter which I entered for the premium offered to girls under twenty-one years of age, by the New-York State Agricultural Society, was made in two days of the last week in August, in the following manner, viz: The milk set in tin pans from 24 to 36 hours, at a temperature of 60° or a little less; cream skimmed off when the milk was slightly changed, and churned within 24 hours. The milk separated from the butter before the salt was added. Ground rock salt was used; the quantity regulated by the taste; after which it was very slightly worked with a butter worker.

Cheese.

Judges.—James E. Southworth, New-York, chairman; Daniel Lassell, Fulton, James C. Duff, Lewis.

2d premium for 100 pounds over 1 year old.—D. C. Beard, Buffalo, $10.

Less than one year old.—1. Hildreth & Brother, Herkimer, Herkimer county $15—2. Sylvester Burchard, Hamilton, Madison county, $10.—3. Fox & Colton, Warren, Herkimer county, $5.—4. Robert Eells, Clinton, Oneida county, Transactions.

Imitation English Cheese.—James Smealie, Princetown, Schenectady county, Transactions.

Three pine apple cheese.—John A. Clark, Albany, Transactions.

The committee remark that there were fourteen samples offered for the premium, but only four of them (besides the imitation English, and the Pine Apple Cheese,) were worthy of a premium. The fault with most of the samples is common to a large portion of the dairies in the state, viz: *too much taste and open make*, and not uniform. There were but two of the samples exhibited where the three cheese were alike. It is all important that the cheese of a dairy should be uniform in its character, both as to taste and manufacture; and until the cheese makers of this state arrive to this point, they must not expect to compete successfully with the English dairymen.

James Smealie's statement of making English Cheese—It was made in the latter part of June, and requires nearly four months before it is fully matured. It was made from two milkings, the number of cows ten. No addition of cream. We endeavor to have the rennet so sharp that from two to three table spoonfuls will curdle the milk in from forty-five to sixty minutes, and add no more than is necessary to perfect the coagu-

Digitized by Google

lation. In regard to the preparation of the rennet, I will copy from a paper written by myself in 1837, on the method of manufacturing English cheese, and published in the July number of the 4th vol. of the Cultivator, by the late lamented Judge Buel. This method I have never seen any cause to depart from.

"Take the stomach of a calf that has been fed on milk, empty it of its contents," (the contents are of little value for rennets, and are frequently offensive to the sight and to the smell,) "rinse it slightly in cold water, put it on a dish, with sufficient salt to preserve it, let it lay for eight or ten days, then spread it out and stretch it on splinters of wood, hang it in a dry place until wanted. It will improve by age. To prepare it for use, take one quart of soft water, and add salt enough to make a strong pickle, boil and let it stand until cold, take your dry rennet, break in pieces, put it in a jar, and add the liquor; in two or three days it will be fit for use, strain, bottle and cork it, and set it in a cool place."

The weight of pressure is from eight to ten hundred pounds. When preparing for the vat, a small quantity of Liverpool salt is mixed with the curd, say a table spoonful, together with about one-fourth of an ounce of pulverised salt peter, to a cheese of 18 or 20 lbs. The remainder of the salting is performed by rubbing the cheese with fine salt every time it is turned in the press, which is every morning and evening for forty-eight hours. They are then taken to the cheese room and turned daily until carried to market. I take this opportunity to correct an error which appeared in the paper alluded to above, viz: that the cream which had collected on the milk previous to coagulation could not be retained in the cheese; experience has taught me otherwise. But I am still persuaded that the most uniform cheese throughout the season is made from milk immediately from the cow. There is much less atmospheric influence to counteract and no difficulty in having a perfectly sweet curd, which is not always the case when the cheese is made from two or more milkings.

SUGAR.

Judges.—Walter Handford, Delaware, chairman; E. E. Platt, Albany; E. H. St. John, West Troy; Samuel Cary, Albany.

Best 20 lbs.—Isaac Burr, Meredith, Del. co., $10.—2. Samuel McGraw, McGrawville, Cortland co., $5.—3. H. F. Shepard, Lawrenceville, St. Lawrence county, $3.—4. E. R. Dix, Vernon, Oneida county, Transactions.

A very fine specimen was exhibited by Jesse Hinds, Brandon, Vt.

Isaac Burr's statement.—The sap is boiled down until fifteen gallons are reduced to one, or thereabouts. This syrup is then, while hot, passed through a *flannel strainer;* after which it is suffered to stand until cold, or perhaps a day or two, as is most convenient. It is then put into a kettle for *sugaring off*, as it is termed, and at the same time one beaten egg is added to every two or two and a half gallons of the syrup, and thoroughly mixed; the kettle is placed over a steady fire, and when at the point of boiling it is carefully skimmed, and this is repeated as often as any skum arises. The boiling is continued until the syrup is reduced so that when a small quantity, while hot, is dropped into a tumbler of cold water, it will cease to spread in the water, but fall to the bottom in a body, and appear like *soft wax*. It is then taken off and suffered to stand in the kettle until partly cool, when it is deposited in a cask or tub. In this manner

Digitized by Google

any number of successive batches may be added, until the cask is full, or the season ended; after which the cask should stand, (in a damp place, if convenient,) for about a month, then tap it at the bottom, and let the molasses drain off. The molasses thus produced is of an excellant quality, and the sugar such as the sample presented.

Honey.

Same judges as on sugar.—Best 20 lbs. Honey—A. Gilmore, Wayne, Maine, $5. 2. David Coonradt, Brunswick, Rens. co., $2. 3. A. Gilmore, Wayne, Maine, $1.

Bee Hives.

Best bee hive.—Gilmore's patent, exhibited by John H. Hidley, Greenbush.

Gilmore's Apiary, exhibited by A. Gilmore, and J. H. Hidley, the committee consider a very important improvement in the management of bees. It is an article meriting the attention of all those engaged in their management.

The following statement from Mr. Gilmore, in relation to the production of honey in his apiary, is submitted:

Last spring, I combined nine swarms into one, and set them to work. I have paid strict attention to them, giving them food, of such articles as they like, early in the spring, and during the season. The whole number of pounds of honey produced this season, up to September 1st, in my Apiary, is 2488 pounds.

157 boxes which sell at $1.25 per box,.....	$196 25
83 show bottles at $1.25 per bottle, ...	103 75
108 tumblers at $0.25 each,.....	27 00
600 lbs. of honey in the apartments, at $0.16 per lb.,.....	96 00
The increase of bees I value,.....	100 00
	$523 00
Cost of feed, boxes, jars and Tumblers,.....	139 00
Leaves a profit of,.....	384 00

The above amount has or can be taken, and still leave a sufficient quantity of honey for the use of the bees during the winter.

Grain, Flour and Seeds.

Judges.—Peter Crispel, jr. Ulster co., chairman; John Horton, St. Lawrence; Henry A. Dubois, Ulster.

Winter Wheat.—1. Samuel Davison, Greece, Monroe co., $5. 2. Obadiah Howland, Cayuga co., $3.

Spring Wheat.—1. Geo. K. Eells, Clinton, Oneida co., $5. 2. H. B. Bartlett, Paris Hill, $3.

Oats.—1. H. B. Bartlett, Paris Hill, Oneida co., (Purdy oats,) 49 lbs. to the bushel, $5. 2. H. B. Bartlett, Paris Hill, another varietv, $3.

Barley.—1. E. R. Dix, Vernon, Oneida co., $5. 2. Obadiah Howland, Cayuga co., $3.

Indian corn.—Obadiah Howland, Cayuga county, Norton's Agriculture.

Digitized by Google

Buckwheat.—1. Wm. P. Coonradt, Brunswick, $3. 2. Hamilton Morrison, Montgomery, Orange co., $2.

Flax seed.—Luman Shepard, Skaneateles, Norton's Agriculture.

Timothy seed.—1. Robert Eells, Clinton, Oneida co., $3. 2. Lumar Shepard, Skaneateles, $2.

Best barrel flour.—1. C. P. Willis, Dresden, Yates co., S. S. Medai 2. R. H. Morris, Geneva, Trans.

Wagon tastefully arranged with farm productions.—John P. Beekman, Kinderhook, $10.

Discretionary.—Sample of teazles.—Luman Shepard, Skaneateles, Norton's Agriculture.

40 varieties of wheat, (deposited in museum,) R. Harmon, jr., Wheatland, Silver medal.

1½ bushels early Kent peas, (earliest grown,) 1 bushel frame peas, and dwarf blue imperial.—Rapalje and Briggs, Rochester, Transactions.

Wheat grits, barley, oat meal, &c.—C. N. Bement, Albany, Trans.

Australian wheat, (very highly commended.)—Samuel L. Thompson, Setauket, Transactions.

Sample of peas.—Obadiah Howland, Cayuga county, Norton's Agriculture.

12 ears of corn, (best.)—R. Harmon, jr., Wheatland, Transactions.

Samples of peat and marl deposited in museum.—Isaac K. Frink, Galway, Norton's Agriculture.

Sample of pork, showing a gain of 375 lbs. in 150 days.—Daniel Smith, 2d, Oppenheim, Norton's Agriculture.

One box gypsum from Grand Rapids.—E. B. & H. Morgan, Aurora, Norton's Ag.

VEGETABLES.

Judges.—J. Batty, Keeseville, chairman; Charles Downing, Newburgh; R. B. Parsons, Flushing.

Twelve best stalks of celery—M. Tillman, Albany, gardener to Dr. Wendell, $3.

Six best heads of cauliflowers—E. P. Prentice, Mt. Hope, $3.

Six best heads brocoli—V. P. Douw, Greenbush, $3.

Twelve best white table turnips—John H. Willard, Troy, $3.

Twelve best carrots—John H. Willard, Troy, $3.

Twelve best table beets—C. F. Crossman, Rochester, $3.

Twelve best parsnips—John H. Willard, Troy, $3.

Twelve best onions—John H. Willard, Troy, $3.

Six best heads of cabbage—John H. Willard, Troy, $3.

Twelve best tomatoes—Andrew Passenger, Albany, $3.

Two best purple egg plants—V. P. Douw, Greenbush, $3.

Best half peck Lima beans—C. F. Crossman, Rochester, $3

Best bunch double parsley—Z. M. Saunders, Watervliet, $3

Best squashes—E. P. Prentice, Mt. Hope, $3.

Largest pumpkin—Henry Vail, Troy, $3.

Twelve ears seed corn—Jacob Henry, Watervliet, $3.

Best half peck of table potatoes—Henry Vail, Troy, $3.

2d best half peck of table potatoes—James M. Sill, Bethlehem, $2.

Best and greatest variety of vegetables raised by exhibitor—C. F. Crossman, Rochester, $5.

Digitized by Google

Discretionary.—Samples of endives—Elisha Dorr, Albany, Trans.
Sample of red peppers—C. F. Crossman, Rochester, Trans.
Sample of red peppers—E. Corning, jr., Albany, Trans.
Sample of red peppers—L. E. Smith, Mechanicsville, Transactions.
Cucumbers—C. F. Crossman, Rochester, Trans.
Tomatoes—Charles McNeil, Charlotte, Vt., Trans
Martinas—Wm. Newcomb, Pittstown, Trans.
Okra—V. P. Douw, Greenbush, Trans.
Rhubarb—Z. M. Saunders, Watervliet, Trans.
Salsify—C. F. Crossman, Rochester, Trans.
Two bottles tomato catsup—Thomas Backus, Rochester, Trans.

Among the articles to which no premiums were awarded, the following are worthy of special notice: Very fine beets were exhibited by John H. Willard, Wm. A. McCulloch, V. P. Douw, Z. M. Saunders. Very fine onions by John Reeve, Henry Vail, C. F. Crossman. Very fine tomatoes, by J. Dingwall, John S. Goold, E. Corning, jr., V. P. Douw, T. Backus, Z. M. Saunders. Onions, by V. P. Douw. Purple egg plant, by Andrew Passenger. Lima beans, by John S. Goold, John H. Willard. Double parsley, by C. F. Crossman. Very fine squashes, by Andrew Passenger, John H. Willard, C. F. Crossman.

The committee have much pleasure in being able to state that the exhibition of vegetables was very fine. In deciding upon the relative merits of the articles submitted to our examination, we have found it difficult in some cases, where the articles in competition were of nearly equal excellence, to arrive at a decision; and in several instances, where only one premium was offered by the Society, it would have given us great pleasure, had we been authorized so to do, to have awarded additional premiums. In such cases, we have taken the liberty to designate, by the terms "*fine*" and "*very fine*," those articles considered by us entitled to special consideration; and to which, we would recommend that the Society yet award some token of its approval.

The committee would also remark that in awarding the premiums, they have had regard, first, to *quality;* secondly, to the *size and general appearance of individual specimens;* and thirdly, to the extent and variety of the exhibition.

A very superior sample of celery, and fine onions, raised by Jacob New, gardener to Oliver Phelps, Esq., Canandaigua, and very fine Mountain June potatoes, raised by Peter Engel, on Mr. Phelps' place, were not received until the Fair had closed, much to the regret of the officers of the Society. Their extraordinary qualities entitle them to this notice; and a volume of Transactions and Norton's Prize Essay is awarded to Mr. New and Mr. Engel.

Class C. Domestic Manufactures, No. 1.

Judges—Archibald Anderson, Fulton county, chairman; Roland S. Doty, Oneida; Silas Arnold, Essex.

Best specimen sewing silk—J. Hutchinson, New York; $8 and diploma.

Best pair woolen blankets—Mrs. Daniel B. Rose, Brunswick, $6. 2. Mrs. James T. Van Namee, Pittstown, $4. 3. Wm. Wilson, West Milton, $2.

Best 10 yards flannel—Miss L. M. Stanton, Martinsburgh, $6. 2. Mrs. L. Shepard, Skaneateles, $4. 3. Miss Minerva Pine, Pittstown, $2.

Best 10 yards woolen cloth—Waterbury & Jordan, Maltaville, $10. 2.

Digitized by Google

Mrs. B. R. Voorhees, Amsterdam, $8. 3. Mrs. S. W. Abbott, Kirkland, Oneida county, $3.

Best 15 yards woolen carpet—Mrs. Henry Weir, Pittstown, $10. 2. Mrs. B. R. Voorhees, Amsterdam, $8. 3. Mrs. Philander Bennett, Mechanicsville, $3.

Hearth rugs—4. Mrs. James T. Van Namee, Pittstown, $2. 5. Mrs. Henry Weir, Pittstown, S. S. Med.

Best rag carpet, 15 yards—Mrs. James T. Van Namee, Pittstown, $5. 2. Miss Caroline Tyce, Webster, Monroe county, $4. 3. Mrs. L. Shepard, Skaneateles, S. S. Medal.

The committee remark that the exhibition in this class was much more limited than they had expected, and they desire to impress upon the wives and daughters of farmers to give more attention to this important branch of household industry.

DOMESTIC MANUFACTURES, No. 2.

Judges—James C. Duff, Constableville, chairman; D. K. Olney, Windham.

Best double carpet coverlet—Mrs. Henry Weir, Pittstown, $5. 2. Cyrus R. Nichols, Bethany, Genesee county, $4. 3. J. J. & A. Davidson, Warsaw, Wyoming county, $3. 4. Abram Koonz, Albany, $2. 5. L. E. Smith, Mechanicsville, Transactions.

A splendid calico quilt, though not strictly belonging to this committee, still we recommend a premium. Mrs. Lucy Ann Gardiner, Clarksville, Albany county, $1.

Best 10 yards kersey—Mrs. Henry Weir, Pittstown, $5. 2. Mrs. E. Bowen, Hoosick, $4. 3. Mrs. James T. Van Namee, Pittstown, $2

Discretionary—10 yards white woolen kersey—Mrs. S. W. Abbott, Kirkland, $4.

Best pair woolen knit stockings—Mrs. O. Northrop, Spencertown, $2. 2. Mrs. B. R. Voorhees, Amsterdam, $1.

Best pair woolen wove stockings—Isaac Ayres, Troy, $2. 2. Mrs. E. Bowen, Hoosick, $1.

Best pair woolen fringe mittens—Mrs. Marietta Clark, Skaneateles, $2.

Three pair woolen socks—Mrs. Isaac Clements, Half Moon, S. S. Medal.

One pair woolen knit stockings—Mrs. Lucy Ann Gardner, Clarksville, Albany county, Diploma.

Two pair worsted stockings, very beautiful—Mrs. M. A. Lawton, Troy, Diploma.

One pair woolen gloves—Mrs. S. W. Abbott, Kirkland, Oneida county, Diploma.

Carpet yarn, very fine, colors very rich—Mrs. R. B. Stiles, Bethlehem, S. S. Medal.

Woolen yarn—1. R. P. & T. H. Wiles, Albany, Diploma. 2. William McElroy, Albany, S. S Medal.

Velvet tapestry, very beautiful—Griswold & Co., Troy, S. S. Medal.

Woolen yarn, very fine—Mrs. O. Northrop, Spencertown, S. S. Medal.

The exhibition in this class was very superior.

DOMESTIC MANUFACTURES, No. 3.

Judges—Isaac Sloat, Rockland, chairman; Wm. Kelly, Dutchess; Wm. B. Pratt, Dutchess.

Best 10 yards linen—Mrs. L. Shepherd, Skaneateles, $8. 2. William

Digitized by Google

Wilson, West Milton, Saratoga county, $6. 3. Mrs. James T. Van Namee, Pittstown, $4.

Best 10 yards linen diaper—Mrs. Mary E. Train, New Lebanon, $6. 2. Mrs. James T. Van Namee, Pittstown, $4. 3. Mrs. Henry Weir, Pittstown, $2.

Best 15 yards tow cloth—Mrs. Henry Weir, Pittstown, $5. 2. Mrs. James T. Van Namee, Pittstown; Small silver medal.

Best pair cotton knit stockings—Mrs. Henry Weir, Pittstown, $2. 2. Mrs. Daniel B. Rose, Brunswick, $1.

Linen knit stockings—1. Mrs. B. R. Norton, Amsterdam, $2. 2. Mrs. Joseph Coons, Brunswick, $1.

Linen sewing thread—1. E. R. Dix, Vernon, $2. 2. Mrs. B. R. Voorhees, Amsterdam, $1.

Discretionary—Very fine linen knit stockings—Artizan Moses, Champlain; Small silver medal. Mrs. B. R. Voorhees, Amsterdam; Small silver medal. James Cantine, Marbletown; Transactions. E. R. Dix, Vernon; Transactions.

Case of flax, in all its different states, and linen thread of superior quality, various colors—Thomas F. Fisher & Co.; Diploma.

Cotton and linen grain bags, superior—Mrs. S. W. Abbott, Kirkland; Small silver medal.

Gloves knit from the hair of the coon, quite a curiosity—Mrs. S. W. Abbott, Kirkland; Transactions.

White woolen yarn, very fine—Daniel B. Rose, Brunswick; Small silver medal.

Woolen yarn, very fine—Mrs. Alonzo Howland, Stillwater; Small silver medal.

Best linen kersey—Mrs. N. Van Ness, Mayville; Small silver medal. 10 yds. 2. Mrs. S. W. Abbott, Kirkland; Transactions.

Ten yards linen cheese strainers—Mrs. S. W. Abbott, Kirkland; Norton's Prize Essay.

Best linen—Miss Ann Mary Cameron, Perth, Fulton county; Small silver medal. 2. Mrs. Joseph Coons, Brunswick; Transactions.

Linen diaper, very fine—Peter Crispell, Jr., Hurley; Diploma.

Tow cloth, very fine—James Cantine, Marbletown; Diploma.

Linen shirts, home made, rare specimen for the present day—Mrs. N. Van Ness, the highest premium; Diploma and Small silver medal,

Patent Batting, quilt wadding, &c.—H. T. Lawton & Co., Troy; Small silver medal.

Linen warp and shoe thread, very fine specimens—Mrs. Parmelia Dean, New Lebanon; Small silver medal.

Berlin yarn, shawl yarn, coach lace yarn, very beautiful—Cohoes Worsted Co., Cohoes Falls; Diploma.

Linen Shirts—1. O. Montague, Troy; Diploma and Transactions. 2. Miss Margaret Stevens, Albany; Small silver medal.

One dozen cotton bags, wove seamless, of excellent quality—A. N. Haskins, Pittstown; Transactions.

Children's lace stockings, very fine specimen of skill—Mrs. B. R. Voorhees, Amsterdam; Small silver medal.

Six grain bags, of superior quality—Mrs. B. R. Voorhees, Amsterdam, Transactions

Digitized by Google

MANUFACTURES, OTHER THAN DOMESTIC.

Judges—Noble S. Elderkin, St. Lawrence, chairman; James M. Cook, Saratoga; Henry Ten Eyck, Madison.

Black broadcloth of very superior fabric and finish—1. James Roy & Co., West Troy, Diploma.

Black broadcloth made in family, and will compare favorably with many of our celebrated manufactories—Philip Dubois, Ulster county; Transactions and Diploma.

Floor oil cloth, best—E. Russell & Son, Albany; Diploma.

Woolen shawls from American wool. The sheep from which the wool was shorn, and of which the shawls were manufactured, received the first premium in class of Saxons. These shawls were very superior, and equal to any ever seen by the committee from any part of the world. James Roy & Co., West Troy; Diploma, Silver medal, and Transactions.

Fancy cassimeres—Samuel Harris & Co., Catskill; Diploma.

The committee recommend hereafter premiums of the first class for carpeting, so as to secure an exhibition from the numerous manufactories engaged in this important business, so advantageous to the wool grower.

NEEDLE, SHELL AND WAX WORK

Judges—Mrs. Jacob Lansing, Albany; Mrs. B. B. Kirtland, Greenbush; Mrs. E. H. St. John, West Troy; Mrs. B. Aiken, Greenbush; Miss Caroline Gallup, Albany; Miss M. Van Bergen, Coxsackie; W. H. Robertson, Westchester, Secretary.

Best ornamental needle work—Miss Helena S. Van Schoonhoven, Albany, $3 and Small silver medal.

Best Ottoman covers—Mrs. Jane Newland, Albany, $3 and Small silver medal.

Best table cover—Miss Henrietta O. Lansing, Watervliet, $3 and Small silver medal.

Best variety of worsted work—Miss Mary E. Server, Albany, $3 and Small silver medal.

Best worked cushion and back—Mrs. Emaline Wagner Starin, Fultonville, Montgomery county, $3 and Small silver medal.

Best worsted work chair—Misses Mary and Helen E. Hickox, Albany, $3 and Small silver medal.

Best worked handkerchief—Mrs. B. Payne, Albany, $3 and Small silver medal.

Best worked quilt—Miss Gertrude Dubois, Ulster county, $3 and Small silver medal.

Best white quilt—Mrs. A. B. Case, Vernon, Oneida county, $3 and Small silver medal.

Best port-folio—Miss Maria T. Bennett, Mechanicsville, aged eight years, $2 and Small silver medal.

Best silk Bonnet—Mrs. P. A. Brown, Troy, $3 and Small silver medal.

Best straw bonnet—Miss Esther Fuller, Westmoreland, Oneida county, $3 and Small silver medal.

Best lamp stand mats—Mrs. Josiah Sherman, Whitehall, $2 and Small silver medal.

Best ornamental shell work—Mrs. F. P. Medina, New-York, $3 and Small silver medal.

Shell cottage—Miss Eliza Carter, Albany, $2 and Small silver medal.

Digitized by Google

1. Wax work—Miss Mary A. Meigs, Albany, $3 and Small silver medal.

2. Wax work—Mrs. Sarah H. Thayer, Albany, $3 and Small silver medal.

Discretionary.—Best worsted picture, (Cromwell and his daugher,)—Miss Sarah M. Davidson, Saratoga county, $3 and Small silver medal.

Greatest variety worsted work—Miss Abby C. Salisbury, Troy, $3 and Small silver medal.

Children's embroidered clothing—Mrs. H. Wyman, Albany, $3 and Small silver medal.

Best white stuffed quilt—Mrs. D. B. Rose, Brunswick, $3 and Small silver medal.

Best black lace veils—Mrs. Alonzo Howland, Stillwater, $3 and Small silver medal.

Infant's embroidered blanket—Mrs. Francis Ives, Troy, $2 and Small silver medal.

Best fire screen, "Convent of the congregation N. D. Montreal,"—Miss Mary Nowlan, Albany, $2 and Small silver medal.

Worsted work screen and picture. Miss Mary Condon, Albany, (10 years old,) Small silver medal.

Two bouquets of wax flowers—Miss L. Hendrickson, Albany, Small silver medal.

Ottoman cover—Mrs. David Fairbanks, Saratoga county, Small silver medal.

Needle work pictures—Mrs. Wm. Eggleston, Albany, Small silver medal.

Landscape (view in Switzerland,)—Miss Jane Skerritt, Albany, Small silver medal.

Christ walking on the water—Miss Mary Skerritt, Albany, Small silver medal.

Embroidered picture, family group—Mrs. P. E. Elmendorf, Bethlehem, Small silver medal.

Two pieces of worsted work—Miss E. C. Dunn, Albany, Small silver medal.

Picture—Mrs. E. Freeman, Albany, Small silver medal.

Picture and chair—Miss Johanna Hill, Albany, Small silver medal.

Scriptural design—Miss Mary E. Silliman, West Troy, $1 and Small silver medal.

Ottoman covers—Mrs. R. L. Johnson, Albany, Small silver medal.

Queen and monk—Mrs. Mary Armitage, Albany, Small silver medal.

Elegant embroidered dress and cloak—Mrs. James I. Johnson, Albany, $2 and Small silver medal.

Best white counterpane—Mrs. B. R. Voorhees, Amsterdam, $3 and Small silver medal.

Best knit white spread—Mrs. B. B. Kirtland, Greenbush, $3 and Small silver medal.

7 patterns fine thread lace—Miss Sarah E. Beverstock, Ogdensburgh, $3 and Small silver medal.

Tufted chair—Miss Mary A. Cary, Albany, Small silver medal.

Crochet bonnet—Miss Ann E. Cummings, Troy, Small silver medal.

Crochet bonnet—Miss Harriet F. White, Albany, Small silver medal.

Best silk quilt—Miss Eliza Carter. Albany, $3 and Small silver medal.

Silk quilt—Mrs. R. J. Hilton, Albany, Small silver medal.

Digitized by Google

Silk quilt—Mrs. Gen. Worth, San Antonio, Small silver medal.
Silk quilt—Mrs. Harriet Lenway, Troy, Small silver medal.
Straw bonnet—Mrs. Ann H. Williams, Chautauque co., $3 and Small silver medal.
Embroidered skirt—Miss Mary Bemis, Canandaigua, Diploma.
Knit spread—Esther Parsons, Albany, Diploma.
Embroidered dress and lace veil—Mrs. John A. Clark, Albany, Small silver medal.
Purses and bags—Mrs. A. L. Godfrey, Albany, small silver medal.
Bead purse and mats—Miss Elizabeth Pexton, (blind,) Westmoreland, Oneida co., $3 and small silver medal.
Worsted work cushion—Miss Eliza E. Ehle, Canajoharie, Diploma.
Crochet tidies—Mrs. Walter A. Wood, Hoosic Falls, Small silver medal.
Tidies—Miss S. P. Avery, Owego, Tioga county, Small silver medal.
Crochet tidies—Mrs. Thos. D. Wells, Albany, Small silver medal.
Blanket and embroidered skirt—Miss Martha M. Townsend, Troy, Small silver medal.
Infant's cloak—Mrs. Partridge, Cohoes Falls, Diploma.
Handkerchief—Miss Emaline Wagner Starin, Fultonville, Diploma.
Handkerchief—Miss Sarah Lynds, Albany, Diploma,
Fancy articles—Mrs. R. Taylor, Albany, $2.
Ottomans, &c.,—Miss Virginia Hendrickson, Albany, Diploma.
Silk bonnets—James H. Darrow, Troy, Diploma.
Infant's blanket—Miss Anne M. Garfield, Troy, $3.
Lamp mat—Mrs. Francis Ives, Troy, Small silver medal.
Lamp mat and purse—Miss Martha J. Aiken, Greenbush, Small silver medal.
Door mats—Miss Anna Swain, Columbia county, Diploma.
Quilts—Miss A. Kennedy, Coxsackie, Diploma.
Gloves—Mrs. B. R. Voorhees, Amsterdam, Diploma.
Woolen shawl—Mrs. Henry Wier, Pittstown, Diploma.
Children's clothing—Miss Harriet Henry, Albany, Diploma.
Three quilts—Mrs. A. Passenger, Albany, Diploma.
Child's embroidered coat—Mrs. Philander Bennett, Mechanicsville, Diploma.
Patch work quilt, 5,000 pieces—Mrs. E. Vanderlip, Albany, Diploma.
Hair flowers—Mrs. B. Wait, Albany, Small silver medal.
Hair flowers—Mrs. Hannah Dunham, West Troy, Small silver medal.
Coat and vest—S. B. Howe, Albany, Small silver medal.
Tufted Rug—Mrs. Wm. Huston, West Troy, $2 and Small silver medal.
Shirt, (very fine)—Miss Mary J. Weed, (7 years old,) Albany, Small siver medal.
Best transferred quilt—Miss Mary E. Frink, West Troy, $2 and Small silver medal.
Bed quilt—Mrs. E. M. Pruyn, Albany, Small silver medal.
Bed quilt—Mrs. B. Payne, Albany, Small silver medal.
Bed quilt—Mrs. Agur Wells, Albany, Small silver medal.
Bed quilt—Mrs. D. R. Rose, Rensselaerville, Small silver medal.
Bed quilt—Mrs. Louisa Allendorf, Columbus, Chenango co., Small silver medal.
Bed quilt—Mrs. Eli Couch, Chemung co., Small silver medal.

Digitized by Google

Velvet quilt (very elegant)—Mrs. P. A. Brown, Troy, $1 and Small silver medal.

Two quilts—Mrs. Mary Witherwax, Guilderland, Small silver medal.

Patch work quilt—Miss Adelaide Nichols, West Troy, Diploma.

Toilette cover—Mrs. J. Clements, Half Moon, Diploma.

Infant's dress—Mrs. Selden Marvin, Chautauque co., Diploma.

Stand spread—Mrs. Louisa Allendorf, Chenango co., Diploma.

Embroidered handkerchief and needle work chair—Miss Sarah Hoffman, Albany, Small silver medal.

Embroidered handkerchief and needle work collar—Miss Maria C. Dillenbeck, Montgomery co., Small Silver medal.

Embroidered linen—K. V. R. Lansingh, Albany, $3 and Small silver medal.

Carpet bag—Miss Lucia M. Shufelt, Columbia county, Diploma.

Embroidered Suspenders—Miss C. P. Freeman, Fultonville, Montgomery co., Diploma.

Fancy work bead bag—Miss Frances Turner, Albany, Small silver medal.

Linen pillow cases—Mrs. S. B. Jones, Troy, Small silver medal.

Embroidery on card board—Mrs. E. Settle, Canajoharie, Diploma.

Knit bed spreads—Mrs. Olivia Mitchell, Fulton co., Small silver medal.

Raised work ottomans—Miss Sarah V. Gourlay, Albany, Small silver medal.

Worsted work—Miss Eliza J. Wooley, Albany, Diploma

Worsted work—Miss Anna Headlam, Albany, Diploma.

Worsted work—Miss Mary E. Horn, Albany, Diploma.

Worsted work—Miss Caroline M. N. Pemberton, Albany, Diploma.

Worsted needle work—Miss Charlotte Amelia Langdon Cook, Cambridge, Mass., Diploma.

Worsted needle work—Mrs. Wm. Frothingham, Albany, Small silver medal.

Worsted needle work—Mrs. A. McIntosh, Albany, Diploma.

Memory piece and chair—Miss A. Dexter, Albany, Diploma.

Slippers—Mrs. S. R. James, Troy, Diploma.

Worsted shawl—Mrs. Lavina Sedley, Lansingburgh, Diploma.

Knit cotton spread—Mrs. John Platt, (aged 80 years) Albany, Small silver medal.

Two quilts, one of 20,157, the other 9,648 pieces—Miss Caroline King, Albany, Diploma.

Quilt—Mrs. L. Dempsey, Albany, Diploma.

Quilt and counterpane—Mrs. Wm. Huston, West Troy, Diploma.

Pair tufted work chair cushions—Mrs. Wm. Huston, West Troy, Silver medal.

Bed spread—Mrs. A. B. Blair, Rome, Small silver medal.

Knit quilt—Mary Frances Brisbane, Saratoga, Diploma.

Stockings and napkins—Frances Courtney, Albany, $2.

Embroidered collar—Miss A. Marcus, Albany, Diploma.

Vase wax flowers—Miss Margaret E. Wilcox, Albany, Diploma.

Superior worsted work picture—Miss Ann E. Shaw, Albany, Small silver medal.

Knit quilt—Julia A. Shallow, Albany, Diploma.

Suspender shoulder braces—K. V. R. Lansingh, Albany, Diploma. Bosoms, collars, shirts, cravats, &c., by same, very superior.

Worked quilt—Mrs. J. S. Keeler, Albany, Diploma.

Digitized by Google

Pyramid of paper flowers—Mrs. James A. Hurst, Utica, Small silver medal.

Ornamental bead work, on card board—Miss Maribah Chase, Albany, 11 years of age, Small silver medal.

FLOWERS.

Judges.—Alexander Thompson, Aurora, chairman; C. W. Hovey, Boston; Samuel Miller, Rochester.

Professional List.—Greatest variety and quantity. James Wilson, Albany, $5. 2. Elwanger & Barry, Rochester, $3.

Dahlias.—Greatest variety. James Wilson, Albany, $5.

Best twenty-four dissimilar blooms. Elwanger & Barry, Rochester, $3.

Best Single Dahlia. L. Menand, Albany, $2.

Roses.—Greatest variety. L. Menand, Albany, $5.

Best twenty-four dissimilar blooms. James Wilson, Albany, $3. 2. Elwanger & Barry, Rochester. $2.

Phloxes.—Best ten varieties. James Wilson, Albany, $3.

Best seedling. James Wilson, Albany, $2.

Verbenas.—Greatest variety. Elwanger & Barry, Rochester; Silver medal.

Best twelve varieties. James Wilson, Albany, $2.

Best seedling. Elwanger & Barry, Rochester, $2.

German Asters.—Best collection. 1. James Wilson, Albany; Silver medal. 2. Elwanger & Barry, Rochester, $2.

Pansies.—Best and greatest varieties. Elwanger & Barry, Rochester, $3.

Best twenty-four varieties. Elwanger & Barry, $2.

Amateur List,—Flowers.—Greatest variety and quantity. 1. John Dingwall, Albany; Silver medal. 2. Wm. Newcomb, Pitstown, $3.

Dahlias.—Greatest variety. Norman Briggs, Schaghticoke; Silver medal.

Best twelve dissimilar blooms. Norman Briggs, Schaghticoke $3.

Best six varieties. Edward Van Alstyne, Greenbush, $2.

Best single variety. Edward Van Alstyne, Greenbush; Small silver medal. Norman Briggs, Schaghticoke, Small silver medal.

Roses.—Greatest variety. Mrs. Henry Morgan, Aurora, Cayuga county; Silver medal. 2. Mrs. E. T. T. Martin, Willow Brook, Cayuga co., $2.

Best six dissimilar blooms. Dr. Alexander Thompson, Aurora, Cayuga county, $3.

Phloxes.—Best six varieties. M. Tilman, gardener to Dr. H. Wendell, Albany, $3. Best three varieties, do., $2. Best seedling, do., $2.

Verbenas.—Greatest varieties. John Dingwall, Albany; Silver medal.

Best seedling. Mrs. E. T. T. Martin, Willow Brook, Cayuga co., $2.

Best six varieties, D. T. Vail, Troy, $3. Best three varieties, D. T. Vail, do., $2.

German Asters.—Best collection. Wm. Newcomb, Pittstown; Silver medal. 2. John Dingwall, Albany, $2.

Pansies.—Best and greatest variety. Wm. Newcomb, Pittstown; Silver medal.

Best six varieties. M. Tillman, gardener to Dr. H. Wendell, Albany. $2.

GENERAL LIST OPEN TO ALL COMPETITORS.

Best collection green house plants owned by one person. L. Menand, Albany; Silver medal. 2. Jas. Wilson, Albany; $3.

Digitized by Google

Best Floral design. M. Tillman, gardener to Dr. H. Wendell; Silver medal. 2. John Dingwall, Albany; $2.

Best Floral ornament. Mrs. James T. Van Namee, Pittstown; Silver medal. 2. Mrs. Wm. Newcomb, Pittstown; $2.

Best hand bouquet, flat. James Wilson, Albany; $3. 2. James Wilson; $2.

Best hand bouquet, round. James Wilson; $3. 2. James Wilson; $2.

Best basket bouquet, with handle. Mrs. Wm. Newcomb, Pittstown; Silver medal.

For the most beautifully arranged basket of flowers. Mrs. D. T. Vail, of Troy; Silver medal. Same to L. Menand, Albany, Silver medal.

Best Floral exhibition by any Horticultural Society. Albany & Rensselaer Horticultural Society; Loudon's Encyclopedia on Gardening.

A beautiful collection of dried plants and flowers correctly named and described, (designed for World's Fair in London, 1851.) Miss Mary M. Chase, Chatham; Silver medal.

Two vols. Floral treasures, similar to the above collection. Miss Eliza E. Cary, Albany; Small silver medal.

A collection of 400 kinds of plants very beautifully prepared. Miss Eliza E. Ehle, Canajoharie; Small silver medal.

Herbarium of the Pine Grove farm, Albany county. Alexander Kirkwood; Small silver medal.

Bouquet of American grasses for Museum of Society. Miss Mary M. Chase, Chatham, Columbia co., Diploma.

For a well executed design, (a sign for Floral Hall.) Miss Sarah Mead, Albany; Small silver medal.

Apples and Pears.

Judges.—Asahel Foote, Berkshire, Mass., chairman; Wm. B. Odie, Piermont; A. Saul, Newburgh.

Apples.—For the largest and best variety of good table apples. Elwanger & Barry, Rochester; Diploma and Hovey's Colored Fruits. 2. Jonathan Battey, Keeseville, $5. 3. Henry Vail, Troy; Transactions.

For best twelve varieties of table apples. Jonathan Battey, Keeseville, $5. 2. E. P. Prentice, Albany; $2 and Transactions.

Best basket of standard fruits. Henry Vail, Troy; Silver medal.

(Twelve varieties of very fine apples and several varieties of choice pears from Hon. O. Phelps, Canandaigua, arrived too late for the Fair, which is much regretted.)

Pears.—For greatest variety of good pairs. Elwanger & Barry, Rochester; Diploma and Hovey's Colored Fruits. 2. Henry Vail, Troy; $5. 3. Wilson, Thorburn & Teller, Greenbush; Transactions.

For the largest and best collection of autumn pears. Elwanger & Barry, Rochester, $5 and Diploma. 2. Dr. Herman Wendell, Albany; $2 and Transactions.

The committee remark, that the efforts of the tried friends of Pomology to sustain the interests of the Fair, have been highly praiseworthy, and numerous fine collections were exhibited, among which, in addition to such as have been honored with premiums, it would give your committee pleasure to notice with more particularity those presented by Messrs. Owens, Dorr, Annesley, and Lloyd, of Albany; Douw and Pratt of Greenbush; Eaton, of Buffalo; Frost, of Chemung; Haviland and Snyder, of Dutchess, and Marks of Greene.

Digitized by Google

PEACHES AND PLUMS.

Judges.—William S. King, Manton, R. I., chairman; J. W. Hays, Newark, N. J.

Best six varieties named and labeled. Alden March, M. D., Albany; $5 and Diploma.

Best twelve peaches. H. G. Dickinson, Lyons; $2.

Best seedling variety, six specimens. Elisha Dorr, Albany; $3.

Best collection plums, six specimens each variety. Isaac Denniston, Albany, $5 and Diploma. 2. A. Marks, Durham, Greene co.; $3.

Best four varieties, six specimens each. Elisha Dorr, Albany; $3. 2. A. March, M. D., Albany; $2.

Best twelve plums, choice variety. Wilson, Thorburn & Teller, Greenbush; $2.

Best seedling plums. Isaac Denniston, Albany; $5.

Preserved cherries. R. H. Drake, Bloomingsburgh; $3.

QUINCES, GRAPES, CRANBERRIES,

Judges.—Paris Barber, Homer, chairman; J. W. Hayes, Newark, N. J.; J. W. P. Allen, Oswego.

Quinces.—Best twelve quinces. Elisha Dorr, Albany; $3. 2. Jno. S. Goold; Transactions.

Grapes—Best and largest collection of Good native grapes. Daniel Ayers, Amsterdam; $5. 2. Elisha Dorr, Albany; $2.

Best three varieties of native or foreign grapes grown under glass three bunches each. H. Vail, Troy; $5. 2. P. S. Van Rensselaer, Clinton Point; $2.

Best dish of native grapes. James S. Goold, Albany; Transactions.

Specimen of black Hamburgh grapes, grown in tub. Gratuity to Mr. Quin, gardener to Henry Vail, Troy; Diploma.

Currants. E. Dorr, Albany; Thomas' Fruits.

Watermelons.—Best specimen of any variety. Henry Vail, Troy; $3. 2. E. P. Prentice, Albany; $2.

Best collection of Watermelons. Henry Vail, Troy; $3.

Muskmelons.—Best specimen of any variety. John Dingwall, Albany; $3. 2. C. F. Crossman, Rochester; $2.

Best collection of muskmelons. E. P. Prentice, Albany; $3.

Cranberries.—Best peck of domestic culture. James Cantine, Marbletown, Ulster co.; $8.

Method of Cultivation.—The soil is a clayey loam, part of it black mould, subsoil impervious sand and clay. Plowed the first time, late in the fall of 1847, sowed to oats the next spring. The spring of 1849 plowed again, and harrowed; marked out one way thirty inches apart with a light plow. The vines were taken from a swamp the middle of May, and planted one foot apart in the furrows. The first season, kept clean by hoeing and weeding. The present year hoed and wed them again—the vines sending out runners in every direction, I concluded I had injured more than I benefited them by weeding out the grass. The only difficulty I apprehend in their successful cultivation, is, their being thrown up by the frost in the spring. Was I to plant anew, I would select drier ground, or such as could be flooded over in the fall and the water let off in the spring.

JAMES CANTINE,

Digitized by Google

Foreign Fruits.

Judges—Herman Wendell, M. D., Albany, chairman; J. W. Hayes, Newark, N. J.; J. Battey, Keeseville,

Pears.—J. W. Hayes Newark, N. J.; Small silver medal and Transactions. 2. C. Goodrich, Burlington, Vt.; Transactions.

Apples.—1. C. Goodrich, Burlington, Vt.; Small silver medal and copy of Downing. 2. Benjamin Brewster, Montreal; Thomas on Fruits.

Grapes.—1. R. S. Colt, Paterson N. J.; Small silver medal and Transactions. 2. J. W. Hays, Newark, N. J.; Transactions.

Peaches—1. J. M. Ward, M. D., Newark, N. J.; Small silver medal and Transactions.

Discretionary Premiums.—Seedling pears and apples. Jasper Curtis, St. Albans, Vt.; Thomas on Fruits.

A box of very superior apples from A. C. Hubbard, Troy, Michigan, arrived too late for the exhibition, much to the regret of the committee.

The committee report, That there was exhibited by Roswell L. Colt, Esq., of Paterson, N. J., twelve varieties of finely grown grapes, viz: Muscat of Alexandria, Muscat Blanche, Dutch Hamburgh, Brown Damascus, Victoria Hamburgh, Muscat Lunel, Seedling from the Black Hamburgh, a delicious grape—name not known, Cambridge Belanock, Golden Chasselas, Chasselas de Fontainbleu, and Black Hamburgh.

By J. W. Hays, of Newark, N. J., Black Hamburgh and White Frontignac grapes. Also, thirty-one varieties of pears, viz: Andrews, Hericart, Napoleon, Dix, Frederick of Wirtemburgh, Beurre Diel, Louise Bonne de Jersey, Marie Louise, Seckel, Duchesse D'Angouleme, Glout Morceau, Winter Nelis, Besi de la Motte, Williams' Bonchretien, Passe Colmar, Rousselet de Rheims, Dearborn's Seedling, Beurre Bosc, Urbaniste, Belle et Bonne, Easter Beurre, Vicar of Winkfield, Beurre Rantz, Cushing, Longuevert, Hacon's Incomparable, Bleecker's Meadow, and Flemish Beauty—all well grown specimens.

By Jaspar Curtis, of St. Albans, Vermont: a seedling pear, with a drawing of the tree, and a description of the fruit and tree. Also, a seedling apple, with a description of the fruit and tree. The committee commend Mr. Curtis for his calling their attention to these native seedlings; but, as they consider the fruits far below the standard required by the Society's rules, in order that they may receive a name or pomological description, they beg leave to decide them *unworthy of cultivation.*

By C. Goodrich, Burlington, Vt.: Red Astrachan, Duchesse d'Oldenburgh, Gravenstein, and Newtown Pippin Apples. Also, Seckel, Flemish Beauty, White Doyenné, Glout Morceau, Bloodgood and Buerré d'Arembúrg Pears.

By Benjamin Brewster, Montreal, C. E.: Canada Crab Apples, beautiful specimens.

By J. M. Ward, M. D., Newark, N. J.: a fine display of Crawford's Early Peaches.

Animal Paintings—Paintings of Fruit.

Judges—Sanford Howard, Albany, chairman; J. McD. McIntyre, Albany.

Specimens of animal paintings in oil, by American artists—T. K. Van Zandt, Albany, $5. R. D. Palmer, Clockville, Madison county; Diploma.

Specimens of animal painting in oil, by foreign artist—Ambrose Stevens, New York, artist unknown; Diploma.

Digitized by Google

Best specimen of painting of fruit, (for Museum,) James Wilson, Albany; $5 and Small silver medal.

Landscape painting, with animal—James M. Gardner, Albany; Silver medal.

Painting of raspberries, commended—E. Emmons, Jr., Albany.

For the premium of $25, offered by the Society for the "best portrait of some animal of improved breed," there were two competitors; but, in our opinion, none of the specimens came up to the standard required by the Society. Some of the pictures, however, possessed evident merit, and render their authors well deserving encouragement. Of this class we are pleased to mention the painting of "Short-horn Cow Charlotte," executed by R. D. Palmer, and offered by S. P. Chapman, of Clockville, Madison county. We understand that this is the first effort of the artist in this line, and we think its character indicates a talent which needs only proper cultivation to ensure eminent success. In view of these considerations, and as an encouragement to further improvement, we recommend that a Silver medal be awarded to Mr. Palmer.

Several paintings were offered by T. K. Van Zandt, of Albany, an artist who, for a number of years, has been well known as a delineator of animals. Most of these pictures are entitled to much credit, and we recommend that Mr. Van Zandt receive a gratuity of five dollars.

A specimen, under the head of "animal painting in oil by an American artist," was offered by James M. Gardner, of Albany, entitled "Old Zach's Whitey." It could not be deemed strictly an "animal painting," as the figure of an animal was merely an incidental feature in the piece, the leading idea of which was a landscape view; but as the picture was thought to possess merit we recommend the award of a Small silver medal.

The only specimen of animal painting by a foreign artist, was that of the "Short-horn bull, Duke of Northumberland," offered by Ambrose Stevens, of New-York, artist unknown to the committee, for which we award a Diploma.

Paintings of fruit.—A group of cherries, comprising three varieties, was offered by James Wilson, of Albany. We are happy to say that we deem them of much excellence, being very natural and accurate delineations of the fruits they are intended to represent, and we hope the artist will continue his efforts, so well begun, in this description of painting. We recommend the award of a Silver medal and $5 to Mr. Wilson.

A painting of raspberries, offered by E. Emmons, jr., Albany, which we think entitled to high commendation.

PAINTINGS, DAGUERREOTYPES, &C.

Judges.—W. W. Forsyth, Albany, chairman; D. Thomas Vail, Troy; John Newland, Albany.

Best specimens of daguerreotypes—D. E. Gavit, Albany, Silver medal.

Best oil paintings—Miss M. L. Wagner, Albany, Diploma.

Best painting in water colors—R. V. Dewitt, Albany, Diploma.

Monocromatic painting—Miss Mary C. Dempsey, Albany, Diploma.

Penciling in India ink—Wm. McCammon, Albany, Diploma.

Painting of flowers for the Museum of the Society—Miss Sarah E. Smith, Albany, Silver medal.

Samples of foolscap and letter paper manufactured in State—Lafflin Brothers, Herkimer, Silver medal.

Digitized by Google

Discretionary.—Drawing with a pen—Mrs. B. R. Voorhees, Amsterdam, Diploma.

Painting in oil—Miss Elizabeth Barnes, Albany, Diploma.

Drawing in pencil, (Melrose Abbey.)—J. J. Hitchcock, West Troy, Diploma.

Drawing of U. S. dry dock, Brooklyn—Augustus Plinta, New-York, Diploma.

Painting in water colors—Mrs. N. S. Washburn, Albany, Diploma.

Foilage in pencil—Mrs. L. H. Brown, Centre White Creek, N. Y., Vol. Trans.

Flowers in water colors—Miss Eliza E. Ehle, Canajoharie, Vol. Trans.

Drawing in India ink, (with left hand,) high pressure engine—Wm. H. Low, Albany, Diploma.

Drawing in water colors—Miss H. L. Whitlock, Albany, Trans.

Specimens of penmanship—O. Penoyer, Ithaca, N. Y., Norton's Essay.

Specimens of heraldry—W. R. Clapperton, New-York, Norton's Essay.

Specimens of lithography—R. H. Pease, Albany, Norton's Essay.

Mezotint window shades—E. S. Edgerton, Albany, Norton's Essay.

Painting in water colors—Julia A. Hinckley, Albany, Trans.

Painting in water colors—Sarah J. Waterbury, Maltaville, Saratoga, Trans.

Painting in oil—Miss Fanny Wilcox, Albany, Trans.

Proof impressions of wood engravings—W. H. Green, Utica, Trans.

Daguerreotype specimens, scarcely inferior to those of Mr. Gavit, who received the first premium—R. E. Churchill, Albany, Medal.

Specimens chemically colored daguerreotypes—Mead & Brother, New-York and Albany, Medal.

Specimen of landscapes—S. D. Humphrey, New-York, Medal.

Daguerreotypes, (favorably noticed,)—S. J. Thompson, Albany, Medal.

Daguerreotypes, the collection embracing portraits of many of our most distinguished men, and excited much interest—D. D. J. Davie, Utica, Medal.

Specimen of sign painting—Stephen Rogers, Albany, Vol. Trans. and Norton's Essay.

The committee report: The occasion that has dotted this busy field with its thousands, is indeed a proud one to all who are interested in the subject of human development. There was a time, not beyond the recollection, perhaps, of some who are now present, when the professions, as they are termed, as well as the higher pursuits of mechanical skill, seemed rather to regard as low minded, the occupation of the hard working farmer; when many of our young men too proud to handle the scythe, or drive the plow, hurried away from their native fields, to seek their fortunes amid the smoke and dust, and Babel-like confusion of city and town. But this feeling has happily subsided, and is now only regarded as one of the vagaries of the past. The relation which now exists between science and Agriculture, has served to place the enlightened farmer side by side, with the man of professional eminence. The pursuit of the one is as progressive as the profession of the other.

The effect of this reaction in respect to Agriculture, is indeed wonderful. The learned treatises on this subject, the multiplication of agricultural papers, the discussions at farmers' clubs, the annual fairs, all indicate the pervading interest which is felt in this great arm of our national prosperity. Agricultural Chemistry is already taught as a distinct branch of science in several of our colleges. And it may not be improper in this

Digitized by Google

connection to express the hope that the period will soon arrive, when the Legislature of our own State, in carrying out the views of the great farming interest, will endow an agricultural school on a broad and proper basis.

No State in the Union, perhaps, has equalled our own in its efforts to promote the interests of Agriculture. Whatever success has followed these efforts, is mainly owing to the New-York State Agricultural Society. The influence of this Society, it is not too much to say, is powerfully felt throughout the length and breadth of the land; its printed Transactions are found in every library; its Annual Fair, attended as it is by strangers from many sections of the Union, reminds one of the great national expositions on the continent of Europe. It started very properly in developing practical Agriculture, as one of the chief sources of industrial wealth. The analysis of soils, the adaptation of particular seeds to particular soils, drainage, improvements in implements of husbandry, and numerous other subjects of vital, practical interest to the farmer, at the outset, engaged its attention. But it has gone far beyond that point. It has brought about, so far as Agriculture is concerned, a relation between the practical and ornamental, and in this way, has blended comfort with elegance. By its means, the mechanic, the manufacturer, nay, even the artist, have been incited, to spread as it were, the products of their skill and taste at the feet of Agriculture. It is only necessary to look around this vast field, teeming with the trophies of industry in all its varied forms, to feel the truth of this remark.

This connection between the practical and ornamental, which has been hinted at, is one of reciprocal influence. For, while it enlarges the sphere for the exercise of taste and skill, developed by other active pursuits, it serves equally at the same time, to throw an air of elegance around every thing that belongs to Agriculture. And had not this bond been formed by the State Society, this committee had not been called upon at the present time to pass their opinion upon the works of art which grace this exhibition. Such a committee a few years ago, would have been deemed out of place, on an occasion like this. The farmer of that day, in strolling about the show grounds of a Fair, would have eyed with complacency a committee on *stock;* but had he met one on paintings and drawings, with their report in hand, it is more than likely that he would have passed by on the other side, with the feelings of the Levite.

There seems to be a beautiful fitness in the encouragement afforded to *art*, by this Society. Many of the finest and some of the most difficult subjects of painting, are drawn from objects which are full of interest to the farmer. Cattle, horses, haystacks, &c., are represented in the best works of the Flemish and Dutch schools. In historical painting, the highest department of art, herbs, flowers, trees, &c., though introduced merely as foregrounds, were treated by the great masters of the sixteenth century, with as much care and laboriousness, as their principal subjects. The successful management of foliage in landscape painting, it is well known, requires the highest skill of which art is susceptible. These simple materials gathered from animal and vegetable life, it will be borne in mind, are capable of being wrought by the genius of the artist into the most perfect forms of ideal beauty. A horse, a dog, or cow if you please, may be correctly painted; and yet, if the picture possesses no greater merit than this, it will be reckoned an inferior example of art. A similar picture, however, by means of a few simple accessories skillfully arranged, may gleam with thought, and tell a story full of feeling and truth

Digitized by Google

It is to be hoped that the managers of the State Society will cherish more and more the idea of gradually forming a collection of paintings and drawings illustrative of agricultural life. The annual outlay in carrying out this purpose would be small, and indeed not worthy of a moment's consideration, in comparison with the benefits which would be conferred on legitimate art. There seems to be a growing feeling among artists of real merit to exhibit their works at the annual State Fair. No better place could be selected. There, amid the moving throng, will be found represented every variety of pursuit and taste. There, products of art will be seen and commented upon by all. By the connoisseur, they will be regarded in the light of criticism—their defects will be exposed, their excellencies applauded. Others, on the contrary, who have paid but little attention to art, will derive from them new impressions in regard to its particular excellence, which may prove so many germs in developing among this class, a taste that will be able to appreciate whatever, beauties imagination may conceive.

With a view of intelligently discharging the duties imposed on them, the committee have examined with great care the numerous paintings, drawings, Daguerreotypes, &c., on exhibition at the present fair. Whilst many of these works are highly creditable, others are entitled to special commendation. The committee, in the course of their examination, found it difficult at times to discriminate between pieces which seemed to possess nearly an equal amount of excellence. Under these circumstances, therefore, it was to them a matter of regret that, by the rules of the Society, they were prevented from bestowing more prizes.

Class D. Stoves—Cooking.

Judges—D. S. Curtis, Canaan, chairman; James W. Baldwin, Kingston; Wm. Masten.

Best cook stove for wood—J. C. Hermance, Albany, dispatch stove, Silver medal. 2. Rathbone & Co., Albany, Small silver medal.

Best cook stove for coal—Thatcher & Hutching, Troy, Silver medal. 2. James R. Hyde, Troy, Small silver medal.

Best cooking range for families—Philip Rollhaus, New-York, Silver medal. 2. C. McLoughlin, Albany, Small silver medal.

Best furnace or other apparatus for warming houses—"Fox & Co.'s patent," C. McLoughlin, Albany, Silver medal. "Chilson's patent Hot Air Furnace," special premium; Tremere, Wands & Co., Albany, Small silver medal.

Stoves—Parlor.

Judges—William Bacon, Richmond, Mass., chairman; Thomas Smith, Schoharie; P. M. Hutton.

Best ornamental parlor stove—"Golden Age" Parlor and Cooking Stove combined: Learned & Thatcher, Albany, Silver medal. 2. R. D. Granger, Albany, "Ben Franklin," which presents a series of improvements which we are sure will commend it to the public; Small silver medal.

Best hall stove—Wager, Pratt & Co., Troy; Silver medal. 2. Morrison & Tibbits, Troy; Small silver medal.

Best sample hollow ware—Davy, Anthony & Phillips, Troy; Silver medal.

Tucker's mirror marble mantel—The committee examined with much pleasure three specimen's of Tucker's mirror marble mantel piece of cast

Digitized by Google

iron, exhibited by Francis Harvey, Albany. These articles, for elegance of design, and beauty of finish, will defy comparison, and in our opinion will drive the costly marble of other countries out of market, so far as its use for mantels is concerned. We recommend to Mr. Harvey a gratuity of a Silver medal.

The list of parlor stoves presented for examination was large, and the variety of name and pattern quite exceeded the expectations of the committee, so that in the performance of their duties they found it difficult to determine between the competitors. In making up their decision, they brought into account two considerations—the elegance of the article, and the combination of good qualities it appeared to possess to commend it for general use. These properties, rather than mere ornamental ones, it was supposed the people would demand, and upon these principles the awards were made.

SILVER WARE, CUTLERY, &c.

Judges—Luke F. Newland, Albany; Benjamin Marsh, do.; Nelson Hascy, do.

The committee on cutlery, britannia ware, &c. respectfully report: That they have carefully examined the following articles presented for their inspection:

Mulford & Wendell, Albany—A case of hollow silver ware, (this being the distinction by which pitchers, tea sets, baskets, &c., are technically known from table ware,) both plain and superbly chased, worthy of the highest encomiums, and, as the committee believe, not to be excelled by any plate made in the United States; Silver medal.

Hall, Hewson & Brower, Albany—A case of silver table ware, consisting of table and dessert spoons, fish knives, forks, sugar spoons, napkin rings, &c.; among this variety, the committee would especially notice a set of dessert knives, six in number, made of California gold, of great beauty and of exquisite workmanship, valued at $250. All of these articles are to be highly commended; Silver medal.

Wood & Hughes, New-York—Two silver pitchers and eight cups of silver, with agricultural devices of good form and finish, and well suited to the purpose intended; Silver medal.

James Mix, Jr., Albany—A case of emblems, of elegant design and good workmanship, for the use of "Odd Fellows," "Sons of Temperance," &c.; Silver medal.

Edward Owens, Albany—A case of surgical instruments for amputation and trepanning, a tonsil instrument, and a set of farrier's knives, all of which are made and finished in the very best manner, and seem perfectly calculated to perform the purposes for which they were designed; Silver medal.

Palmer & Co., Springfield, Mass.—An artificial leg, which seems to be an admirable substitute for the real, being wonderfully adapted to perform the various functions of the natural limb; Silver medal.

Smith & Feltman, Albany—Best britannia ware of good style and excellent workmanship; Diploma. Also, the same goods, silver plated by the galvanic process, an excellent and durable article; Silver medal.

J. H. Whitlock, Troy—A general assortment of britannia ware *cast* and *turned*, of a good silver like color, and well made. This process is cheaper than polishing, and equally serviceable; Small silver medal.

Willis Humiston, Troy—A set of britannia ware, candle moulds, made in workmanlike manner; Diploma.

Digitized by Google

William Brown, Albany—Silver plated door plates and lock trimmings. Also silver plated harness trimmings, all made in a workmanlike manner; Silver medal.

The Waterville Manufacturing Company, Waterbury, Conn.—Samples of American pocket cutlery of very superior workmanship and finish. These goods show that it is not necessary to go abroad for pocket cutlery; Silver medal.

Freeman & McDonough, Albany—Samples of enamelled ware, (Fenton's patent). This ware is beautiful in appearance, exceedingly durable, requiring a powerful blow to break it, and capable of being used for culinary purposes, being fashioned into a variety of forms for domestic use. Its invention is important to the community in general; Silver medal.

Nathaniel Wright, Albany—A quantity of coach lace, tassels, a card of ornaments, &c. Also, coach and harness mountings, all of good style and workmanship, especially two sets of pole mountings. Also, a pair of coach lamps of elegant form and superior finish; Silver medal.

G. L. Jones, Albany—A block tin dish cover in one piece, an important improvement, very silver like and durable; a masterly piece of work; Silver medal and Diploma.

Van Heusen & Charles, Albany—Sundry articles of planished tin ware of very superior quality. They consisted of large and small urns for hot water, coffee biggins, coffee filterers and coffee pots, very strong and durable and not injured by standing upon a hot stove. The workmanship was of the very first order; Diploma.

Miscellaneous Articles.

Judges—C. P. Barber, West Troy, chairman; T. S. Davis.

Best ornamental cast iron vase on pedestal. Emery & Co,, Albany; Diploma.

Best sample drain tile. Halsey Woodruff, Albany; Diploma.

Water ram. Emery & Co., Albany; Silver medal.

Best ornamental cast iron chair. Emery & Co., Albany; Diploma.

Best double acting force pumps. Downs, Mynderse & Co., Seneca Falls, N. Y.; Silver medal.

Best suction and lifting pump. Downs, Mynderse & Co., Seneca Falls, N. Y.; Diploma.

Best sample of card clothing. James D. Watson, Troy; Diploma.

Best sample of fire brick. Henry, Van Allen & Palmer, Albany; Dip.

A sample of drain tiles made by machinery exhibited by A. S. Babcock, Albany, are very valuable and useful articles.

Discretionary, No. 1. Articles of Metal Composition.

Judges.—Elon Comstock, Oneida; Benjamin Enos, Madison.

The committee on implements and machinery, and all articles of metal composition, respectfully report: That the entries in their department were numerous, and the articles of such a varied character, as to require much time for a proper investigation of the merits of the several articles exhibited, and a knowledge of the different branches of labor, science and art to which your committee can make no pretensions. After a patient application to the duties devolved upon them, during two full days, the following conclusions have been arrived at, and are now respectfully submitted.

The first articles on our books was a stand of rolls for rolling gold and silver, entered by *F. & T. Townsend, of Albany.* The exhibitors, although

Digitized by Google

not, as we understand, deficient in this world's goods, had none of the precious metals with which to test the practical working of the machine, but judging from its general appearance and workmanship, we esteemed it a valuable article. We are not informed whether the exhibitors claim the merit of the invention; a Diploma.

Messrs. Townsend also exhibited a "chilled roller, for rolling iron and copper," a grand article. Also a "plate for grinding clay," and a "kettle for boiling plaster," both of which seemed to be of good material and workmanship; a Diploma.

James G. Dudley, of Buffalo, presented two cast iron tree boxes, for the protection of shade trees. They were of handsome pattern, and beautiful workmanship, and the committee would regard their general introduction a public benefit, especially as they hope it would tend to promote the planting and cultivation of shade trees, in the public streets of our cities and villages. This article furnishes a perfect protection against the depredations of animals, and renders the growing of shade trees even in our business streets, quite practicable; a Diploma.

Messrs. Starks & Pruyn, of Albany, contributed to the show a variety of useful articles, among which were beautiful patterns of iron railing for fences, balconies, &c., an iron tree box, and several iron doors for bank vaults, and other places requiring protection against burglars and fire; a cast iron table frame, with marble top; samples of bridge bolts; several letter-copying presses, and other articles too numerous to mention. The committee know not how to better express their approval of all these articles, than by saying that they are worthy of the high reputation which the manufacturers have acquired in this branch of mechanichal skill—a reputation as wide as the demand for the useful articles produced with so much industry and enterprize; a Diploma.

Davy, Anthony & Phillips, of Troy, exhibited a variety of ingenious and well manufactured heaters, for tailors' shops, laundries, and for private family use; all of which seemed well calculated for the purposes intended, and will no doubt elicit the approval and warmest thanks of that worthy class of laborers, for whose benefit they were invented; Prof. Norton's Prize Essay.

Hoy & Wilson, of Albany, exhibited a variety of tinman's tools and machinery, which were pronounced by competent judges, worthy of commendation; Small silver medal.

Amos Dean & Co., proprietors of the Albany Argillo Works, had on exhibition a large display of wares of their manufacture, consisting of *door-knobs*, locks, bell-pulls, mantel-pieces, &c. The material from which these articles are made, is obtained from the clay banks in and about this city, combined with the proper coloring matter, for giving variety and beauty to the articles manufactured. We have been surprised in witnessing the beauty, both of polish and color, which have been given to these articles, and have no doubt that further experiments will enable the manufacturers to introduce a still greater variety from the same material. Should the clay banks of this city furnish the material for a great variety of articles to send abroad, it may fairly be considered an offset for the bricks imported from Europe, at an early day, of which some of the old Dutch houses now standing, were built; a Diploma.

Henderson, Weller & Co., of Albany, exhibited their "parlor grates," adapted to the use of coal, and ingeniously provided with an ornamental

Digitized by Google

front for placing in the back in summer, rendering the whole highly ornamental; Vol. Transactions.

H. W. Covert, of Albany, called the attention of the committee to an iron safe, of ample dimensions, and superior workmanship, which we have no doubt would pass through the fiery ordeal with the greatest security to its contents. It is difficult, however, without an actual trial, or a knowledge of the material and construction concealed from view, to speak positively of its merits, still from the superior workmanship, we recommend a Silver medal.

Rykeman & Seymour, of Peekskill, exhibited several iron forges for ships. These articles are portable and convenient. The bellows is placed directly under the forge, and is quite concealed from view; and the whole arrangement seemed economical; a Diploma. The same gentlemen also called our attention to several *iron grindstone frames*, which though involving no new principle in their construction, are nevertheless useful articles.

E. Clemingshaw, of Troy, exhibited a case of brass trimmings for steam engines, locomotives, &c. The beauty and high finish of these articles entitle them to great commendation, and to the attention of the public; Vol. Transactions and Norton's Prize Essay.

R. G. Fox, of Troy, exhibited a card of files of assorted sizes. They were said to have been re-cut from old files, and to be "as good as new." Of this last fact your committee could not speak with entire confidence, but consider the files a good article, and were pleased to see such an exhibition of American manufacture; a Diploma.

Isaac Doolittle, of Rochester, exhibited "Crossett's patent Stave Machine," which is represented as capable of cutting sixty barrel staves per minute, from blocks previously steamed and prepared. We did not see it in operation, but some specimens of work were shown us which appeared well done; Vol. Transactions and $3.

N. Randall, of Syracuse, exhibited several of "Fisk's patent burial cases," which were regarded as a very useful invention. They are constructed of metal, perfectly air-tight, and seem very well adapted to the use for which they are intended; Norton's Prize Essay.

J. Adams, of Brooklyn, exhibited a carpet cleaning machine, which, although it did not seem to belong to this committee, was examined by us. It is, doubtless, a labor saving machine, and where carpet whipping is to be done extensively, would find patronage.

James Jenkinson, of Albany, exhibited a patent spark arrester, for locomotives, which seems to be constructed upon approved principles, and is recommended by railroad superintendents and others connected with the business; a Diploma.

William Munsig, of Albany, presented an assortment of gas fixtures of beautiful workmanship and pattern; a Diploma.

Matthias P. Coons, of Lansingburgh, exhibited a rock drilling machine, which works well, and we should judge would drill with greater dispatch than can be done by hand; Vol. Transactions.

Ross & Smith, of Rochester, presented eight rolls of machine belting, a patented article, said to be superior to that heretofore in use. It certainly appears to have some merits not found in other belting, but the committee were not informed of what materials it was composed, and they can only express the opinion that it possesses some advantages over leather and rubber belting; Vol. Transactions.

Digitized by Google

E. Flagler, of New York, had black and white smith's forges, which are well calculated for their respective uses, and entitled to the favorable notice of the Society; a Diploma.

Russell, Birdsall & Co., of Port Chester, had a card of screw bolts, iron nuts, stove rods, &c. The bolts are manufactured by machinery, with great facility, and are a very neat article; Vol. Transactions.

J. & S. Snow, of Rochester, had on exhibition samples of brass, copper and iron wire, evenly and uniformly woven, and deserving of notice; a Diploma.

Hotchkiss & Sage, of Windsor, Broome county, "Stirrup noddle irons," for saw mills, which one of your committee, acquainted with the business, pronounced first rate; Vol Transactions.

David Ray, Chatham, Columbia county, exhibited Kendall's thermometers, which looked well, and have a wide reputation.

D. Addee, New-York, presented three cases and one box of American steel, which appeared to be a superior article; Vol. Transactions.

The Adirondack Steel Co., Jersey City, exhibited one case of American steel, made exclusively from American ore, and a first rate article; a Diploma.

Brown, Strevell & Zeh, Albany, presented B. Rowe's patent machine for stretching and splitting leather, an article which may be appropriately denominated a *shaving machine*, but which, on account of its many useful qualities, the committee think worthy of the Society's commendation; a Diploma.

Noyes & Hutton, Troy, called the attention of the committee to several cast iron bedsteads. The beautiful patterns and handsome finish of these articles afforded another evidence of the great variety of uses to which iron castings may be appropriately applied; a Diploma.

J. H. Batterworth, Dover, Morris county, New Jersey, presented a patent combination bank and safe lock, which our limited time and opportunity did not enable us to investigate fully, but which was pronounced a valuable article of the kind, and apparently proof against burglars; a Diploma.

Woolensack & Hoffman, Albany, also presented a lock, for which they claim great merit. H. W. Covert also presented one of "Lilly's patent locks," which seemed to be all right; but your committee, with their limited knowledge in so important a matter, will not undertake to decide between them.

G. W. Eddy, Waterford, had on exhibition several of his patent car wheels. The best recommendation they can have, is the fact that they are in use on nearly all the railroads in this section; Norton's Prize Essay.

Andrew Meneely, West Troy, had, as usual, an assortment of bells from his foundry. They abundantly sustained the high reputation of the manufacturer, whose fame is almost world-wide in this branch of manufactures; a Diploma.

J. Semmons, Albany, had on exhibition a quantity of "bell metal pens." The fact that this report was written with one of them would not be taken by the public as evidence of superiority, but we nevertheless thought them very good; a Diploma.

N. French, of Rome, had on the ground a morticing machine, which seemed well adapted to the use intended, and also to boring as well as morticing; Vol. Transactions.

Guy Davis, Syracuse, called our attention to a steam valve, which pre

Digitized by Google

sents some improvements upon those formerly used, and has the approval of competent engineers; a Diploma.

Nathaniel Wright, Albany, presented samples of electro-galvanizing of vegetables. The specimens were fine, although the art is rather ornamental than useful; but we have no doubt that further trials may prove its adaptation to many useful purposes; Downing's Fruits.

Mr. Ballard, of New-York, presented some samples of rural fence made of cast iron, of handsome patterns, and resembling a common rustic fence; Vol. Transactions.

Phelps & Gurley, of Troy, had a case of engineers' and surveyors' instruments of superior finish and apparent accuracy, and which contributed largely to the exhibition; Silver medal.

John Rodgers, Albany, exhibited a steam boiler and a tobacco-cutter, both in operation. The former was certainly a useful and meritorious article, and judging from the demand for the weed turned out by the latter, we are constrained to form the same opinion of that also. It certainly worked well and is an improvement upon the machines heretofore in use; a Diploma for each.

Reuben Robinson, West Troy, had an inclined plane hinge and window blind fastener, an ingenious and useful article; Thomas' Fruits.

S. B. Snedeker, Cincinnati, Ohio, also had a patent blind fastener; Vol. Transactions.

John E. Jones, Rochester, exhibited Arnold's patent sash lock, which worked well, and must be a valuable article. It received a premium from this Society in 1849; Vol. Transactions.

Lyman C. Higinbotham, Oneida, Madison co., exhibited a miniature steam engine, made by himself, and showing great ingenuity for a boy 16 years old without experience or practice in machinery. He will make a machinist of skill and ability beyond a doubt; Silver medal.

George P. Jackson, Schenectady, presented a similar article, and deserving of the same notice, he being about the same age; Silver medal.

Emery & Co., Albany, exhibited eleven samples of saws, manufactured in Albany by W. B. Gregory, which were deserving of notice; a Diploma.

Thomas Whalen, Albany, presented six brass force pumps of great power and merit; a Diploma.

Julius A. Pease, Philadelphia, exhibited Pease's patent sash supporter, a valuable article; a Diploma.

James Harrety, Troy, set of eliptic carriage springs, for which he claims an improvement. The committee were unable to speak confidently of the claim, without seeing them in use.

Roy & Co., West Troy, samples of wrought and cast iron butts, all good articles; Vol. Transactions.

J. E. Holmes, New-York, a boiler punch, which has great power and works admirably. Also one anti-friction wheel and sector press for printers, bookbinders, oil mills, &c.; this article is highly recommended by the best judges, and the committee take pleasure in adding their approval; a Diploma and Vol. Transactions.

William Prescott, Buffalo, Warner's patent stove-pipe; this consists in the simple, yet exceedingly useful improvement of turning the ridges usually raised near the ends of the joints, in the form of a screw, making the whole perfectly secure, and a great protection against fires; a Diploma.

John F. Winslow, Troy, presented specimens of railroad iron, being Seymour's patent double rail, by which all the advantages of a continuous

Digitized by Google

rail are said to be secured. This rail is highly recommended by Engineers and others, but the committee are not competent to express any confident opinion of its general merits. One great improvement is certainly secured in doing away with the through joints which cause much the greatest proportion of the wear and expense of repairing the track. If it shall prove in other respects equal to the single rail, a great improvement will have been effected. These rails are made at the Mount Savage Iron Works, Maryland; Silver medal.

There were two sowing machines exhibited; one by Lee & Jones, of Cambridge, N. Y., and the other by Le Row & Blodgett, New York. We examined both of them and saw them in operation. They do their work rapidily and well—that of Lee & Jones being perhaps best adapted to shops, and the other to the family use, on account of its more moderate expense; Silver medal to each.

F. S. Low, Albany, had a steam engine in full operation on the ground, driving all the machinery, and which attracted much attention; Diploma and Silver medal.

Henry Warren, Troy, exhibited two coils of block tin water pipe, made by T. Otis Le Roy & Co., New-York. It is a good article, superior in many respects to lead, and we think may be generally introduced; Vol. Transactions.

Albert Dwelle, Albany, exhibited an iron turning lathe, of superior workmanship and finish. Mr. D. does not, however, claim for it any new principle, and we can only commend his work to favorable notice; Diploma.

W. P. & C. B. Wright, Rochester presented a bevel sawing machine, which seems well calculated for sawing in almost every shape; Vol. Transactions.

S. W. Chubbuck, Utica, called the attention of the committee to a telegraph operating machine and apparatus manufactured by him. Mr. Chubbuck is an original mechanic, and without any previous knowledge of the business, commenced the manufacture of these instruments, and has so well succeeded as to supply the entire Morse line with them. The machine referred to, was in operation on the grounds; Vol. Transactions.

ARTICLES OF WOOD.

Judges.—Samuel Cheever, Saratoga, chairman; Seth Norton, Berkshire, Mass.; Elias Butler, Dutchess.

The committee upon implements and articles of wood, report: That they have had several articles submitted to their inspection; some *new*, and some fine specimens of such as had been before produced. A scythe snath of peculiar curve, so as to make with the scythe, almost three-fourths of a circle. The patentee, W. S. Chamberlin, of Savannah, Wayne co., N. Y., says, its advantage over the other snath, is, that in the motion for cutting the grass, the left arm is kept extended at length, and is capable of exercising as much power as the right; whilst with the common snath, as the scythe comes round to the left, the arm is drawn up, and in a measure disabled. The committee are of opinion that there is some weight in the suggestion. The design is ingenious, and in use, may prove advantageous; but it must be from use alone that its superiority can be tested. There were grain cradles exhibited, whose snaths were upon the same, or nearly the same curve. They were also exhibited at Syracuse, last year. The idea of the one was doubtless taken from the other. Mr. Chamberlin, for adapting this principle to the scythe, is entitled to credit, and should it prove

Digitized by Google

useful, will be entitled to the thanks of the Society, for affording relief to one of the most severe labors of the farmer. But as its present value must depend upon experience in use, the committee will leave the inventor to receive from the Society, and from the public hereafter, such reward as his invention shall deserve; a copy of Transactions is recommended to Mr. C.

The committee also examined a gate, patented by Parkinson, and exhibited by Charles Schofield, Paris, Oneida co. The gate is in two pieces, divided vertically in the center, and opens each way. The front is opened vertically down to the ground, wide enough to receive the frame of the gate the end of which is set in the post, and the only hinge or hanging consists of a pin either of wood or iron, through the post and timber of the gate frame near the ground. A pully may, or may not be used to aid in raising the gate. When open, the two parts of the gate stand upon the outer end. The advantages claimed are, the cheapness and simplicity of construction, as any farmer can make it without the use of iron. It is not embarrassed in opening, by the snows of winter, and does not swing to by the wind, to be caught by the carriage, nor can it be opened by animals; a vol. of Transactions is awarded.

An ornamental sign of wood letters, carved, and got up with much skill and good taste, by James H. Darrow, of Troy; Vol. Trans.

Davy, Anthony, & Phillips, Troy, presented a set of block patterns, for the "Lady Washington Parlor Stove." The patterns evince much skill in the design, and the castings appear truly beautiful. But as the stove when completed, is more appropriately the subject of a premium than the block or patterns, the committee suppose the manufacturers will be taken care of, by the committee on stoves; a Diploma is recommended for the beauty of the patterns.

John Byrne, of Albany, presented a puncheon of excellent workmanship and finish, showing that whoever puts liquor in his casks, will know where to find it; a Vol. of Trans.

S. B. Rexford, Sherburne, Chenango co., presented a wooden chain of two feet or more in length, made while in a bad state of health, with a penknife, from a pine stick about three-fourths of an inch square. It is fitted with swivel and rings, with loose balls enclosed, challenging competition even from the Chinese, in ingenuity and patience; a Vol. of Trans.

Charles H. Cook, Coeymans, Albany co., presented a quilting frame, for which he has a patent. The committee are of opinion that all good housewives, who make their own bed quilts, and whose husbands dislike to be crowded out of the house whilst the process is going on, will find this a valuable improvement. The entire frame sustains itself somewhat after the manner of a cot bedstead, and a quilt of any size does not occupy but 3½ feet in width, is rolled over cylinders upon each side, without separating, and the quilt may be brought to any height to suit a sitting or standing posture, and upon a level or an inclined plane; a Diploma.

O. Tingley, of Albany, presented some very finely finished specimens of Lindley's patent bedsteads, going together with a screw cut upon the end of the rail going into the post so close as to exclude all vermin. He showed his skill in the art of staining, by which he converts white wood and maple into very good black walnut. He makes a good and cheap article, which the public will not fail to appreciate; a Diploma.

Miller & Loomis, Westfield, Mass., presented a washing and fulling machine, lately patented, which promises, in the opinion of the committee, to

Digitized by Google

answer a valuable purpose. Patent washing machines, are as thick as the "leaves of Valambrosia;" and whoever shall produce one that will do what most of them profess to do, will deserve much; for if the useless washing machines stowed away about the country were collected, they would come nigh to filling our entire Fair ground.

The machine of Messrs. Miller & Loomis, is constructed with a vertical cylinder, with ribs or buckets, which revolve within another cylinder, set also with ribs, leaving a space of about four inches in the clear, which is occupied by the clothes These are, together with the water, put in violent motion by the revolving cylinder, and it is claimed that the clothes are rapidly cleaned, without wearing, breaking of buttons, hooks and eyes, &c. The machinery is very simple, requiring but two cog wheels. It is not improbable that the same machine would make a good churn; it can be cheaply constructed; a Diploma.

Lewis Tupper, of Genoa, Cayuga co., presented a washing machine, for which he has a patent. It consists of an elongated box of common form, with twenty-one rollers of one inch diameter, upon a circular line, on the bottom, over which is suspended a corresponding set of rollers, worked to and fro, by a lever. The rollers are pressed together by a vertical screw, acting upon a spiral spring.

This machine will doubtless be very efficient in removing dirt from very dirty clothes; but whether buttons, hooks and eyes, &c., will come out as they go in, is not so clear; a Diploma.

ARTICLES OF IRON AND WOOD COMBINED.

Judges.—Grove Lawrence, Syracuse, chairman; Edward Huntington, Rome; H. Lewis, Oswego.

Planing machine, for floor moulding, "Woodworth's patent"—John Gibson, Albany, Diploma and Trans.

Scales, letter press and trucks, well manufactured—Duryee, Forsyth & Co., Rochester, Diploma.

Smut machine, a good article—Leonard Smith, Troy, Small silver medal.

Lifting and compressing power, a useful improvement—B. Newbery, Catskill, Trans.

Lot of scales—Five ton hay scales, three portable platform scales, thirteen small scales, fine articles, J. L. Brown, maker, N. Y., Emery & Co., agents, Albany, Silver medal.

Patent hames, a valuable improvement—Nathan Post, East Cleveland, Ohio, Diploma and Trans.

Case edge tools, the best specimens on exhibition—L. Bolles, Smithfield, N. Y., Diploma and Trans.

Five spring chairs and two piano stools, splendid articles, finely manufactured—American Chair Co., Troy, Silver medal and Trans.

An assortment of tools and planes, of fine quality, especially the planes, augers and plows—E. & C. Carter, Troy, Diploma.

Two smut and scouring machines, fine machines—F. Harris & Sons, Brooklyn, Diploma and Transactions.

Smut machines, an excellent machine, but expensive in construction—Albert Duel, Lowville, N. Y., Trans.

Excavating scraper, cheap and valuable implement—Joseph Sweet, Huesville, Penn., Diploma.

Digitized by Google

Machine for stretching and fitting leather—Wm. Snell, Albany; Diploma.

Four store trucks, substantial articles and well made—A. B. Allen & Co., New-York; Diploma.

Shingle machine, this machine cuts two shingles at the same time, is valuable improvement—Dennis S. Stow, Cohoes; Diploma and Trans.

Wheeler's square boring and morticing machine; two machines were introduced, but the preference is given to this machine as the most simple—C. G. Cross, Albany; Diploma and silver medal.

Morticing machine; this is a valuable machine, but more complex than Wheeler's, but best adapted to soft wood—W. J. Tucker, Rockford, Ill.; Diploma and silver medal.

Self-acting hydrants, no person present to explain this machine—Wells & Co., New-York.

Case of wrenches and morticing tools, beautiful articles, well made—Ruggles, Nourse, Mason & Co., Worcester, Mass.; Diploma and Trans.

Six scales, the best articles of the kind exhibited—Hitchcock & McMaster, Rochester, Diploma; Small silver medal and Trans.

Model car truck, this is a valuable improvement—J. W. Moyer, Mendon; Diploma and Trans.

Apple paring, coring and slicing machine, fine little machine and works well—Lyman Root, Lake co., Ohio; Thomas' Fruits.

Patent leather dresser, works well and is a valuable improvement—Dudley Moore, Norwich, Chenango co.; Diploma and Trans.

One wagon axle and hub, this is an improvement deserving of encouragement—E. S. Scripture, Green Point, N. Y.; Diploma and Silver medal.

Screw cutting machine, this is a valuable improvement—A. C. Powell, Syracuse; Diploma and Silver medal.

Two portable mills and one flour bolt, these are cheap and simple in construction and valuable improvements—Charles W. Brown, Boston; Diploma and Trans.

Ross' improved Fitzgerald's burr stone mills—Chas. Ross, Rochester; Diploma.

Buckwheat scourer, a fine machine, and likely to work well—Leonard Smith, Troy; Diploma.

Blacksmith's bellows, a fine substantial article—W. Story, Albany; Norton's Essay.

Grates for burning anthracite coal—Robert Hilson, Albany; the committee not having an opportunity of testing this grate cannot speak of its qualities.

Iron grate—A. D. Spoor, Troy; same remarks as to the last.

Ross' Fitzgerald's Mill.

The portable burr stone mill, patented under the name of Fitzgerald's, and improved by Charles Ross, is adapted to grinding, in the most perfect manner, wheat, corn, and all other kinds of grain, paints, salt, blacking for foundry use, &c. &c., at a saving of 30 to 50 per cent. of power over the flat stone mills; also combining simplicity, efficiency and durability.

Description.—This mill consists of a solid cone of the best French burr, revolving on a horizontal shaft within a stationary concave of burr stone, firmly set within a cast iron shell. The grinding surfaces are reduced to a perfect face, which receives a light dress, and when dull by use, may readily be redressed by a steel pick.

The running burr revolves, so that its surface approaches with exactness

Digitized by Google

to the stationary concave, according to any desired guage, being regulated by an adjusting screw, attached to the journal at the end of the cone shaft, and so arranged as not to heat the flour or meal during the most rapid and continued motion of the runner.

The mill is securely adjusted to a compact iron frame, all complete for operation, either by water, steam, wind or horse power; is of small compass, and may be attached by belt to any driving drum as readily as an ordinary grind-stone.

The mill adapted to plantation or frontier use, is about as large as a peck measure, and will grind from three to seven bushels of grain per hour, according to the power and speed applied; it may be contained in a box 30 inches square by 16 inches deep, and when packed weighs about 300 pounds, price $100.

Hand mills, for naval service, price $60.

Flour mills of larger size, all complete for attachment and for use in the largest flouring establishments, varying in price, according to size, from $150 to $400 each.

ARTICLES NOT INCLUDED IN PRECEDING REPORTS.

Judges.—Orville Hungerford, Watertown, chairman; Benjamin N. Huntington, Rome.

Superior trunks, valises and enameled travelling bags—Lyman J. Lloyd, Albany; Diploma and Small silver medal.

Chart of agricultural chemistry—E. L. Yeomans, Saratoga; Diploma.

Marble mantel pieces—J. Dickerman, Troy; Silver medal.

Marble mantel pieces—Wm. Gray, Albany; Small silver medal.

Mineral paint—Charles A. Mott, Lansingburgh; Diploma.

Mineral paint—John Buswell, Oneida Castle; Diploma.

Boiled ham, very fine—B. W. Waters, Maryland; Norton's Essay,

Boiled ham, very fine—D. H. Cary, Albany; Norton's Essay.

Artificial teeth—O. P. Yates, Troy; Diploma.

Case of dentistry, &c.—S. Dunham, Lansingburgh; Diploma.

Window blind opener and fastener—Lawrence & Farnsworth, Claremont, N. H.; Trans.

Patent stirrup iron—Nathan Post, East Cleveland, Ohio; Small silver medal.

Patent hame attachment—J. Monks, Philadelphia, Penn.; Norton's Essay.

Patent bedsteads—A. Adams, Troy; Downing.

Hames, trunks and hose, with Brown's couplings—E. B. Slason, Albany; Norton's Essay.

Graduating Spirit Level—Perry Hodge, Warsaw, N. Y.; Small silver medal.

Russet leather and belt leather—Frost & Fowler, Albany; Trans.

Black Walnut Parlor Furniture—John Arts, Albany; Small silver medal.

Set mahogany furniture—H. Parsons, Albany; Small silver medal.

Page's sash fastener—James Gardner, Berne, Albany county; Diploma.

Paper hangings—Wm. Richardson, Albany; Silver medal.

Hats and Caps—William Frothingham, Albany; Diploma and Silver medal.

Hats and Caps—Rousseau & Boughton, Troy; Silver medal.

Trusses and abdominal supporters and braces—Osborne & Co., Troy; Small silver medal,

Digitized by Google

Confectionary—A. W. Forest, Troy; Thomas' Fruits.

Paper Hangings—L. Steele & Co., Albany; Silver medal.

Boots and shoes—Young & Server, Albany; Diploma.

Elegant parlor furniture—John Meads, Jr., Albany; Diploma and Silver medal.

Ladies' and gentlemen's writing case—John Winne, Albany; Small silver medal.

Specimens of Dyeing. James Condon, Albany; Norton's Essay. m

Furs, gloves, muffs, caps, &c.—George C. Treadwell & Co., Albany; Diploma.

Specimens tobacco, segars, snuff, cocoa and chocolate. Payne & McNaughton, Albany; Diploma and Transactions.

Large assortment of coffee and spices—John Thomas, Jr., Albany; Trans.

Superior India rubber goods, cow milker, &c.—James McMullen; Albany; Diploma.

India rubber cow milker—Dr. C. Knapp, Brooklyn; Diploma.

Artificial Globes—Cyrus Lancaster, Albany; Norton's Essay.

Velvet window shades—D. Harris, Jr., Albany; Small silver medal.

Pole cat robe—A. Wright, Hoosic Falls; Thomas' Fruits.

Horse skins, imitation of morocco. Perkins & Heaselgrave, Albany; Norton's Essay.

Specimen of leather tanned by Hibbard's patent process—L. &. H. Churchill, Rochester; Silver medal.

Best morocco and calf skins, tanned by Hibbard's patent process—Sardis Allen, Oswego; Small silver medal.

Book binding—Heartt & Jones, Troy; Small silver medal.

Gentlemen's kid gloves—Jonathan Ricketts, Johnstown; Small silver medal.

Case of guns, pistols, &c.—O. Churchill, Albany; Norton's Essay.

Spiral spring mattrasses—Ballou & Shanks, Albany; Norton's Essay.

Specimens of Dyeing—N. S. Dean, Albany; Transactions.

Specimens of Dyeing—Peter B. Leddy, Albany; Downing.

Patent soap—Lord, Lynch & Co., New-York; Diploma and Norton's Essay.

Brooms and broom brushes—J. W. J. Brownson, Amsterdam; Diploma.

Shower and douche baths—Thomas Holbrook, Utica; Norton's Essay.

Confectionary—Mrs. Grace Anderson, Albany; Thomas' Fruits.

Pier glass and table. J. Burton & Co., Albany; Diploma and Silver medal.

Specimens of colored tallow candles—W. D. Wood, Cohoes; Norton's Essay.

Cologne—George G. Hurll, Albany; Diploma.

Splendid hose carriage, made by Cheesebro & Elmendorf—Tivoli Hose Co., Albany; Diploma and Silver medal.

Vulcanized rubber belting—Emery & Co., Albany; Small silver medal.

Assortment of planes—Bensen & Crannell, Albany; Norton's Essay

Model bark mill—Green & Gallagher, Kingston, N. Y.; Diploma.

Sand paper—D. W Whitman, Brooklyn; Norton's Essay.

Drawings of plans and principles of Rochester canal weigh lock scale—Duryee, Forsyth & Co., Rochester;; Diploma.

(By reference to report of committee No. 38 it will be seen that the drawings in this case were also presented to that committee.)

Machine belting—Davis & West, Salina; Norton's Essay.

Digitized by Google

Cider and currant wine—G. L. Randall, Greenville; Small silver medal.

Abdominal and spine supporters—L. Babbitt, Keeseville; Small silver medal.

Ornamental penmanship—Hiram Pierce, Newburgh; Diploma.

Harness articles patented by J. W. Briggs, manufactured at Newark, N. J.—J. W. Briggs, Cleveland, Ohio; Silver medal.

The following articles were examined by a special committee after the regular committee had closed their examinations.

Soda biscuit—Patrick Dunigan, Albany; Diploma.

Model of a Grecian conservatory—John Casey, Albany; Transactions.

Improved fruit picker—Kelsey & Spearpoint, Syracuse; Diploma.

A case of birds, fishes, &c., of Oneida co., elegantly prepared, (for world's exhibition, 1851).—J. A. Hurst, Utica; Silver medal.

Soda or mineral water, very superior—Lewis & Lapeus, Albany; Small siver medal.

Fishing rods and reels, very superior—J. & J. C. Conroy, New York, Warren & Steele, agents, Albany; Diploma.

Case of wigs and hair work, very superior—Justus W. Blanchard, Albany; Diploma.

Blank books, very elegant work—Koch & Co., New-York; Diploma.

Specimens of graining—G. W. Merchant, Albany; Diploma.

Agriculturaal "bride's cake," an article of most beautiful design, and in all respects executed and arranged with superior taste—Benjamin Briare, Albany; Silver medal.

Very superior ice creams—Benjamin Briare, Albany; Diploma.

Ladies embossed gaiters and slippers—Young & Server, 520 Broadway, Albany; Silver medal.

Apple paring machine—William Fay, Chester Factories, Mass.; Dip.

Ornamental show card, highly commended—Martin V. B. Young, Albany.

Ornametal show cards, highly commended—Alfred Harris, Albany (15 years of age.)

Burr mill stones, articles of superior workmanship—Adam R. Smith, Albany; Diploma.

Blacking and pepper sauce—Rosekrans & Ovens, Albany; Diploma.

MUSICAL INSTRUMENTS.

Judges—George Loder, New-York, chairman; George Warren, Albany; John C. Scherpf, New-York, Secretary Am. Musical Fund Society.

Grand piano forte, J. Chickering, is a good specimen of Chickering's manufacture, which is celebrated throughout the country, and although no instrument of a similar kind is offered for competition, the committee consider it entitled to the highest consideration; Diploma and Silver medal.

Square piano fortes, eight in number, are admirable specimens of a style of manufacture that is reflecting the highest credit upon American ingenuity, both in this and the old world. Of the instruments submitted, we consider those of Messrs. Boardman & Gray, Albany, as entitled to the first place on account of their extreme quality and rich fullness of tone; Diploma and Silver medal.

Ballantine & Barhydt, Albany, the second, for its excellence of touch and great equality; Silver medal.

The two square piano fortes of J. Chickering come next for brilliant tone and good touch, but inferior only in equality of tone, in which respect they do not vie with similar instruments from the same factory that have

Digitized by Google

heretofore come under the inspection of the committee; Small silver medal.

The dolce campana attachment of Boardman & Gray, is affixed to the three instruments viewed by us. It is a very delightful addition to the piano forte, being perfectly legitimate in its application, and not conflicting with the original tone, but subduing it to extreme delicacy, and thereby, when the pressure of the pedal is removed, giving the effect of a crescendo, never before achieved upon this instrument. It well deserves the highest honor; Diploma and Silver medal.

Melodeon; very excellent, and a good specimen of American manufacture. Kinnicut & Watkins, Troy; Silver medal.

Drums, most excellent manufacture. George Kilbourne, Albany; Silver medal.

Mr. George Warren, one of the committee, in relation to the square piano fortes dissents from the opinion of his associates, believing that the two instruments of Chickering have a purity of tone which the others do not possess. All of those noticed by the majority of the committee, commend themselves highly to the favorable notice of the Society.

SPECIAL REPORT, ON ARTICLES NOT EXAMINED BY STANDING COMMITTEES.

Judges—R. Varick De Witt, chairman, Albany; Prof. George H. Cook, Joseph Cary, and Ichabod L. Judson, Albany.

The committee to whom were referred the articles hereafter named, submit the following report, with their awards.

They examined with care the articles submitted to them, and state in connexion with each their views in relation thereto.

Specimens of chirography—The Lord's prayer, in various (sixteen) languages, the work of Dr. Gabor Napheggi, a Hungarian, is a beautiful exhibition of ornamental painting and writing, exhibiting patience, industry, learning and taste.

The committee award a Diploma to its ingenious author, and suggest, under the circumstances connected with its exhibition, that the same be accompanied with a special complimentary note from the Secretary to Mr. Napheggi.

Grain weighing, registering and discharging machine—This is an ingenious, simple automatic apparatus, calculated to perform the operations indicated by its title, with great accuracy and certainty. It may be used on a small scale, in a portable form, for ordinary mills, or the lesser class of storehouses, or be employed in the operations of the mammoth mills and their corresponding storehouses, which abound in our country. Scores or millions of pounds can be weighed, registered and discharged, without the aid of man, further than to furnish the grain to be estimated, to the hopper of the machine. It would appear to be a labor-saving machine of much importance to all who trade in the great staple of this State, and may be applied to advantage to the measurement by weight of all granular and fluid substances.

The committee award a Silver medal to O. Bush, Lafayette, Indiana.

Vandewater's water wheel—This ingenious machine is a horizontal acting, submerged wheel, externally of the usual dimensions and appearance of a reaction or Turbine wheel. By an ingenious arrangement of its internal chamber, the water is made to act in a direct impulsive manner upon the arms, and then at a certain regulated velocity, leaving the spaces between the arms without back or retarding action. The committee are informed

Digitized by Google

that this is the first effort to make a direct action wheel to act under water. It is certainly accomplished in a very perfect manner, and to such purpose that, if the testimonials of the inventor are to be credited, it possesses very superior advantages over every form of submerged wheel now in use.

The committee award him a Diploma.

Barrel of coarse salt from Geddes, manufactured by solar evaporation—S. C. Brewster, Geddes. (This barrel of salt, by the omission of the person having it in charge on the ground, was not brought to the notice of the judges appointed on salt.) The handsomest article that the committee have ever seen of this kind of salt, and in their opinion deserving the Society's Diploma.

Gutta Percha tube from the Hudson Manufacturing Co.—A beautiful article, to which the committee award a Silver medal.

Harvey's hot-air furnaces—These apparatuses, in the hurry of the examination, were overlooked by the appropriate committee when engaged with those articles. This committee has inspected them carefully. The one is a coal furnace, and the other a wood furnace. The former has been in use in this city and elsewhere very extensively for three years, with a good reputation. Without making any comparisons of value between this and other furnaces in common use, the committee would express their commendation of the convenient arrangements, judicious disposition, and complete workmanship of the specimens exhibited to them. They see no reason why these furnaces should not be placed on a par with any other ones that are before the public.

All of which is respectfully submitted, by order of the committee.

(The committee also examined the cast iron mantel-pieces exhibited by Mr. Harvey, of Albany, supposing they had been passed by; but it appears, see Report 60, that they were duly examined and passed upon by the regular committee.)

The committee appointed to examine the plated and japánned hot air registers of C. McLoughlin, exhibited at the New-York State Fair, report, That the articles have been examined carefully. They appear to be well made and adapted for registers, and ventilators, and are creditable specimens of American art.

Their chief recommendation is the neat and simple mechanical arrangement for opening and closing their doors, which I consider a decided improvement upon the usual modes of effecting the same, and worthy of notice from the Society.

Unless the articles in question are in competition with similar articles, in which case I cannot report, not having seen any but these registers, I recommend the award of a medal. R. V. DE WITT.

Digitized by Google

ANNUAL MEETING, JANUARY 15, 16, 1851.

The Society met in the Assembly Chamber, which had been tendered to the Society by the Honorable the House of Assembly, on Wednesday, the 15th of January, at 12 o'clock. The attendance of members and delegates was larger than at any previous meeting of the Society.

The Society was called to order by the President, E. P. Prentice, Esq.

Mr. Johnson, the corresponding secretary, read an abstract of the report of the Executive Committee. The report alluded to the increased interest which has been manifested during the past year, in the prosperity and advance of Agriculture, as well as in sustaining the agricultural societies throughout the State.

The report alluded to the approaching World's Fair, to which contributions have been forwarded from this State.

The Secretary read a report in regard to the World's Industrial Exhibition, reciting the steps which had been taken by the Society in regard to that exhibition, and the appointment of the following delegates to attend the exhibition on behalf of the Society:

Hon. Martin Van Buren, of Columbia; Hon. John A. King, of Queens; E. P. Prentice, Esq., of Albany; H. Baldwin, Esq., of Onondaga; B. P. Johnson, Esq., of Albany.

The Secretary also read a report on a resolution referred to them, in regard to holding two annual Fairs. The committee reported against the resolution.

These several reports were accepted.

Luther Tucker, Esq., Treasurer, made his annual report, which was accepted, as follows:

m

RECEIPTS.

On hand at close of last year,	$2,101 80
Received at annual meeting,	108 00
Of Secretary for memberships,	12 00
Of Comptroller,	800 00
Interest of investment,	560 00
Borrowed,	1,000 00
Received at State Fair,	10,465 61
For use of tent,	200 00

Digitized by Google

Life member,	50 00
Premium repaid,	20 00
Silver plate for premiums on hand,	230 00
	$15,546 91

EXPENDITURES.

Paid for premiums,	$5,220 36
Trial of plows,	291 12
For Prof. Johnston's Lectures,	246 21
County surveys,	335 00
For tents,	900 57
Library and Museum,	301 77
Salary, &c., of Secretaries,	1,841 52
Miscellaneous,	465 72
Loan account,	1,012 69
State Fair expenses,	1,638 17
Printing, binding, &c.,	650 71
Add value of plate on hand, for premiums,	$230 00
Cash to balance,	$2,413 07
	$15,546 91

Mr. Geddes, of Onondaga, moved a committee of three from each judicial district, to nominate officers and recommend a place for holding the next Fair; the committee to be chosen by members present from each district.

Mr. Marks, of Greene, suggested five from each district; but did not press the motion.

The original motion was carried.

The members from the several districts reported the following committees, under Mr. Geddes's resolution; and the committees were appointed by the Society:

First District—Messrs. A. Thompson, L. B. Ward, and Ambrose Ste-

Second District—Messrs. T. Bell and D. C. Briggs, Westchester, and A. J. Downing, Orange.

Third District—Messrs. J. P. Beekman, Columbia; S. Howard, Albany; and Geo. Vail, Rensselaer.

Fourth District—Messrs. S. Stilwell, St. Lawrence; Richard Keese, Clinton; Le Roy Mowry, Washington.

Fifth District—Messrs. H. Wager, Oneida; E. Merriam, Lewis; and H. J. Sedgwick, Onondaga.

Digitized by Google

Sixth District—Messrs. E. C. Frost, Chemung; Noah Hitchcock, Jr., Cortland; and Benjamin Enos, Madison.

Seventh District—Messrs. M. G. Warner, Monroe; J. M. Sherwood, Cayuga; and T. G. Yeomans, Wayne.

Eighth District—Messrs. L. F. Allen, Erie; S. M. Burroughs, Orleans; and A. Smith, Chautauque.

Mr. L. F. Allen, of Erie, suggested that if there was any locality prepared to offer sufficient inducements for the Society to hold their next Fair, this was a proper time to make the fact known.

Mr. Bissell, of Monroe, said the citizens of Rochester had raised already a fund of $5,000, and had executed a sufficient bond to hold the Society harmless, in regard to all expenses, if the Fair should go to that city.

Mr. Keese, of Essex, suggested that the President and Secretary be added to the committee.

Gen. Viele, of Troy, suggested that the committee was of the usual number, and he would deprecate its increase.

Mr. Keese withdrew his suggestion.

Mr. Miller, of Rochester, gave additional reasons for holding the next Fair in that city.

The committee retired for consultation; and the Society adjourned to meet at 4 o'clock.

The Society met at 4 o'clock P. M.

Hon. John P. Beekman, from the committee appointed to nominate officers, &c., reported,

That the city of Rochester was recommended as the place for holding the next Fair, provided the requirements of the executive committee should be complied with.

The committee reported the names of the following gentlemen for officers the ensuing year:

President—JOHN DELAFIELD, of Seneca.

Vice-Presidents—WILLIAM BUEL, Monroe; SILAS M. BURROUGHS, Orleans; LEWIS G. MORRIS, Westchester; ANTHONY VAN BERGEN, Greene; AUGUSTUS L. CLARKSON, St. Lawrence; HENRY WAGER, Oneida; BENJAMIN ENOS, Madison; RAY TOMPKINS, New-York.

Corresponding Secretary—B. P. JOHNSON.

Recording Secretary—J. McD. McINTYRE.

Treasurer—L. TUCKER.

Executive Committee—JOHN B. BURNET, M. G. WARNER, JOSIAH W. BISSELL, BENJ. B. KIRTLAND, AMBROSE STEVENS.

Digitized by Google

The report of the committee was accepted, and the gentlemen named elected by ballot.

Mr. Pardee, of Wayne, was instructed by his Society to call the attention of the State Society to the distribution of the Patent Office Reports and Foreign Seeds. The Reports are often sent to persons not at all interested in them. So of Seeds. The Wayne County Society desire that the State Society should, if practicable, secure as many of the Reports as possible, and distribute them discriminately. The Seeds, even more generally than the Reports, are injudiciously distributed. He cited several cases where a valuable variety of Wheat and Corn had been introduced into Wayne county by mere accident. The same Society had also directed its delegates to petition for the circulation of a larger number of the Report of the American Institute. It was a valuable document, which was much sought for.

Mr. P. offered the following resolutions:—

Resolved, That in pursuance of the resolution of the Wayne County Agricultural Society, the Executive Committee be directed to make application to the United States Patent Office for copies of their Report, (and also a portion of the seeds there deposited,) for gratuitous distribution among the several counties in this State, the reports to be by them distributed among agriculturists in the way of premiums.

Resolved, further, That an increased number of copies of the Transactons of the American Institute be obtained for like purpose.

(It appears that the number of copies of the Institute Transactions ordered for distribution by the Legislature, have not been received.

LIFE MEMBERS.—Mr. L. F. Allen, of Erie, suggested the propriety of reducing the rate of life membership, to $10. The present rate of $50, was too high. If reduced, large numbers would avail themselves of the privilege of life membership. The interest on $10 would be nearly equal to the fee exacted for a yearly membership, and he thought the interest of the Society would be promoted by the change he had suggested.

Mr. Keese, of Essex, concurred in the suggestion, and moved an amendment to the constitution to meet it.

Mr. Viele, of Rensselaer, doubted the policy of this motion. It might aid the funds of the Society for a single year, but it would, he feared, operate disastrously thereafter. It would, also, be unjust to those gentlemen who had exhibited their patriotism by paying $50 to constitute themselves life members. By a sudden influx of money, the Society might be induced to enter upon some extravagant operation. The Rensselaer County Society had made the experiment of life membership. Being anxious to erect buildings, they had solicited the principal citizens to become life members.

Digitized by Google

The call had been responded to. The result was, that nearly all interested in the Society have become life members, and for a year or two past, the Society had run in debt some $400. He feared that some such disastrous result would follow from this movement

Mr. Morris, of Westchester, suggested that the money derived from this source, should be invested in a permanent fund.

Mr. L. F. Allen believed no mischief would result from a temporary influx of money to the Society. Its managers would doubtless have wisdom enough to make good use of it.

Mr. Morris reduced his suggestion to a motion; which was lost.

Mr. O. Allen, of Erie, advocated the motion to reduce the rate of life membership. He believed it would result beneficially; that it would stimulate agriculturists, all over the State, to permanently identify themselves with the Society, and that a very large number of persons would cheerfully pay $10, who are not now even yearly members. Nor did he fear any mischief would result from the mismanagement of this fund.

Mr. Taylor opposed the amendment for various reasons assigned.

The motion was carried, and the constitution was amended as proposed.

Two-thirds of all the members present, on the call of their names voting in favor of it.

On motion of L. F. Allen, of Erie,

Resolved, That the present accommodations for the Agricultural Museum of the Society in the old State Hall, are too limited for the arrangement of the articles already deposited with the Society and that the Society most respectfully solicit from the Legislature an extension of the rooms for the use of the Society.

Reduction of tolls on Drain Tile.—Mr. Murray, of Oswego, wished to secure the influence of the Society to secure the reduction of tolls on draining tile. At present the toll is nearly equal to the price of transportation. It is an article of very recent manufacture, and he had no doubt of the policy of his suggestion. He offered a resolution for a committee to bring the subject before the Canal Board.

The resolution was passed, and

The Chair named Messrs. Burroughs, Tucker and Kirtland, such committee.

Mr. J. B. Nott of Albany, wished to call the attention of the Society to a discovery made by Mr. Comstock, of Dutchess. That gentleman believed his discovery important; and Mr. N. moved a committee of five to confer with Mr. C. as to what action it would be proper to take in the premises, their report to be submitted to a future meeting of the Society.

Mr. L. F. Allen suggested that the report be made to the Executive

Digitized by Google

Committee, or to the Society, as the Society would not have another meeting for a twelve-month.

Mr. A believed there was something at the bottom of this discovery, particularly useful to tree culturers, however utopian it might appear.

Mr. Beekman stated his views and experience in regard to the principle, which he deemed really important. He did not, however, deem Mr. C. the discoverer of the principle, for he had seen it acted upon long before he ever saw Mr. Comstock, who had entrusted him with the secret.

The resolution was amended as proposed by Mr. Allen, and adopted.

The Chair appointed the following committee: Messrs. Nott, Downing, Van Bergen, L. F. Allen and Prentice.

The Society then adjourned to meet at the Agricultural Rooms, Thursday morning at 9 o'clock.

THURSDAY, Jan. 16.

The Society met in the Agricultural Rooms to award the premiums.

Award of Premiums.—Management of Farms.

1. Premium: Rawson Harmon, Wheatland, Monroe county, Silver Cup, value, $50.
2. D. D. T, More, Watervliet, Albany county, cup, $30.
3. E. M. Bradley, East Bloomfield, Ontario county, cup, $20.

David Coonradt, Brunswick, Rensselaer county, Transactions.

Butter.

1. Exhibited by Ela Merriam, Leyden, Lewis county, $15.
2. Exhibited by Joseph Cary, Albany, $10.

Special premiums to Nelson Van Ness, Chautauque, and Noah Hitchcock, Jr., Cortland county, for very fine samples; Vol. Transactions.

Roswell L. Colt, Esq., Paterson, N. J., presented a pot of Butter made from the milk of Alderney cows, which was pronounced in flavor and quality superior to any butter exhibited before the Society; having the peculiar characteristics of the butter produced from this celebrated breed of dairy animals.

Thanks of the Society were tendered to Mr. Colt, for this choice sample of Butter, and Diploma.

Cheese.

The second premium $10, awarded to Robert Eells of Oneida co.

Winter Wheat.

1. Wm. Hotchkiss, Jr., Lewiston, Niagara county, 63½ bu. per acre, $20.
2. S. L. Thompson, Setauket, L. I., 44 bu. 1 peck, $15.
3. Justus White, Pamelia, Jefferson co., 40 bu. and 2 pecks, $5.

Indian Corn.

1. Peter Crispel, Jr., Hurley, Ulster co., 100 bu. 1-32 per acre, $20.
2. Robert Eells, Oneida county, 84 bu. 16 quarts per acre, $15.

Squire Foster, of Hillsdale, Columbia co., had 97 18-32 bu. on one acre, but as the regulations required two acres no premium could be awarded.

John Binsse, of Pamelia, Jefferson co., had 575 bu. by weight and 560 by measure, on 8 acres and 9-10ths of land.

Digitized by Google

Oats.

1. H. B. Bartlett, Paris, Oneida county, Barley Oats, 88 bu. 14 quarts per acre, $15.
2. George K. Eells, Clinton, Oneida county, 87 bu. 3 quarts, $10.
3. H. B. Bartlett, Paris, Oneida county, common oats, 84 bu 21 qts, $5.

E. M. Bradley, East Bloomfield, raised 83 bu. 7 qts. per acre.

Barley.

1. E. M. Bradley, East Bloomfield, Ontario county, 53 bu. per acre, $15.
2. E. R. Dix, Vernon, Oneida co., 44 1-3 bu., superior quality, $10.
3. Wm. Baker, Lima, Livingston co., 47 14-48 bu. per acre (quality not equal to Mr. Dix's,) $5.

Peas.

1. E. M. Bradley, East Bloomfield, 41¼ bu. per acre, $10.
3. J. Rapalje, Rochester, "Early Kitt" Peas, fine specimen. Vol. Transactions.

Beans.

1. Asahel R. Dutton, Meredith, Delaware co., 30 bu., 20 qts. per acre, $10.

Potatoes.

1. Quality: H. B. Bartlett, Paris, Oneida co., 304 bu. "Mountain Reds," $15.
1. Quantity: Nathan Taft, Pittstown, Rensselaer co., 325 bu., $15.

Ruta Baga.

1. Valentine H. Halleck, Northeast, Dutchess county, 1,015 bu. per acre, $10.

Carrots.,

1. E. Risley & Co., Fredonia, Chautauque co., 951½ bu. per acre, $8.
2. N. Hayward, Brighton, Monroe co., 431 bu. per ½ acre, $6.

Cauliflowers.

John S. Goold, Albany; Lewis E. Smith, Halfmoon; Vol. Transactions to each.

Tobacco.

1. M. G. Warner, Rochester $5.

Timothy Seed.

1. Robert Eells, Oneida co., $5.
2. Geo. H. Eells, Oneida co., $3.

Fruit Premiums.

There were several varieties of seedling Apples offered for premiums, but neither of which were equal to the standard required by the rules of the Society to entitle them to such notice. One, however, offered by N. Hayward, of Monroe county, is considered by the committee nearly equal to the standard.

Apples.

For the largest and best collection, (34 varieties,) to W. A. Regens, of Wayne county; a Silver medal and Diploma.

For the second largest and second best, (27 varieties,) to N. Hayward

Digitized by Google

of Brighton, Monroe county; a volume of Downing's Fruits and a Diploma.

For the third largest and third best, (25 varieties,) to F. W. Lay, of Greece, Monroe county; a volume of Downing's Fruits.

For the fourth largest and fourth best, (24 varieties,) to Peter Patterson, Moscow, Livingston county; a volume of Transactions of the Society.

For the fifth largest and fifth best, (21 varieties,) to J. W. Bailey, of Plattsburgh, Clinton county; a volume of Thomas' Fruits.

For valuable collections, to Luther Harger, of Plattsburgh; E. M. Bradley, East Bloomfield; M. J. Pardee, Palmyra; Wm. Newcomb, Pittstown; E. P. Prentice, Albany; Charles Lee, Penn Yan; T. G. Yeomans, Walworth; E. C. Frost, Chemung; and to R. Handy, Ogden, Monroe county; Vol. Downing's Fruits.

For valuable collections, but less in number to preceding, to David Emery, of Ithaca; J. H. Watts, Rochester; John Donellen, Greece; J. Johnson, Brighton; H. Hooker, Rochester; H. Dale Adams, Brighton; E. Darrow, Greece; R. H. Brown, Greece; and C. J. Ryan, Rochester; copies of Thomas on Fruits.

And for valuable, but still smaller collections, to Dennis Clarke, of Palmyra; Joel Hale, Marion; Eli Barnum, Walworth; D. Tomlinson, Schenectady; H. B. Bartlett, Oneida county; Henry Vail, Troy; Wilson, Thorburn & Teller, Albany; David Coonradt, Brunswick; W. P. Coonradt, Brunswick, Rensselaer county; E. G. Stearns, Gorham, Ontario county; Stephen Hyde, Palmyra; Henry Powis, Seneca Falls; copies of Norton's Elements of Agriculture.

Pears.

To Henry Vail, of Troy, for best collection exhibited; a volume of Downing.

To R. G. Pardee, of Wayne county, for second best collection; a volume of Thomas on Fruits.

Grapes.

For the best collection on exhibition, to Joseph Cary, of Albany; Downing's Fruits.

For the second best collection, R. J. Pardee, of Palmyra; a volume of Thomas on Fruits.

To Townend Glover, of Fishkill Landing, for a collection of models of fruit in composition, consisting of 37 varieties of Plums, 22 of cherries, 16 of apples, 18 of pears, 4 of quinces, 12 of strawberries, and 7 of nectarines, invented and made by exhibitor, and intended for Horticultural, pomological, and agricultural societies; for instruction of members and convenience of committees; and admirably adapted for purposes intended; a Silver medal and Diploma.

Foreign Fruit.

To F. H. Elliott, of Cleveland, Ohio, for a collection of gate apples; volume of Transactions.

To S. E. Goodrich, of Burlington, Vt., for several varieties of apples; Thomas on Fruits.

Wines.

To Miss Sophia Goodrich, of Burlington, Vt., for a collection of six varieties of domestic currant, gooseberry, and elderberry wines; a Small silver medal, and a copy of Norton's Scientific Agriculture.

Digitized by Google

To James Stoddart, Palmyra, Wayne county, for specimens of wine manufactured from seedling grapes, resembling black cluster; a copy of Downing's Fruits.

To George Vail, of Troy, for a specimen of wine made from Isabella grapes; a volume of Transactions.

A most beautiful display of colored fruits, painted at the Ebenezer Society, near Buffalo, was exhibited by J. H. Watts, of Rochester, aud the thanks of the Society were tendered to Mr. Watts for the paintings.

THURSDAY EVENING, Jan. 16.

The meeting was called to order in the Assembly Chamber, by E. P. Prentice, President of the Society.

The Secretary read the awards of premiums.

The President then introduced A. J. DOWNING, Esq., of Newburgh, who delivered an eloquent and appropriate address on Agricultural Education.

ADDRESS.

Mr. President and Gentlemen:

The time for the annual meeting of the State Agricultural Society has come round, and I find you assembled in this chamber to review the labors of the past, and to lay broader plans and mature higher aims for the coming year. You have had a fruitful season. The divine promise of seed time and harvest has been again fulfilled. You have stored your barns and granaries with those treasures of the field that make plenty throughout the land, and you have given thanks to the God of the husbandman for the blessings he has poured out upon you. And now that nature has wrapped over the earth her soft white mantle, and a sweet sleep has descended on your fields and gardens; you have met together here again to confer on the great interests of Agriculture, and to lay out the best high roads that it is possible to make in the unexplored region of the farmers' land of promise.

Gentlemen, I am glad to meet you here, the interests of the farmer are very dear to me, and I have accepted your invitation to glance at them with you on this occasion, because I wish to urge on you the necessity for unremitting exertion in what I conceive to be the great and growing want of the time to the agriculturists of the country; I mean, of course, agricultural education, a subject in which both the farmers and the country have a deeper interest than the public seem at all aware of.

Gentlemen, the old soothsayers and astrologers used to argue prosperity from the conjunction of powerful stars, when any important event was about to take place. Now, although I have little faith in any prediction, (except those about the weather in that good old fashioned annual, The Farmers' Almanac,) yet I confess I augur something propitious from the conjunction

Digitized by Google

of the two great bodies of legislation and agriculture in this chamber to-night.

And what does the American farmer want? Has not nature given him a climate in which the best bread-stuffs and the finest fruits of the temperate zone ripen; has he not a ready market and light taxes; is he not the lord of the soil he cultivates, and does he not hold it under the freest and best of governments? Nay! does he not participate, with his fellow-citizens, in the blessings of popular education diffused by our common schools? Yes, Gentlemen, this is all true; but the American farmer occupies a new and hitherto unknown position, and it is on this account that the country and age demand from him something more than the low range of character that marks the cultivator of the soil in many other countries. *Politically*, his is by far the largest class in the country, and upon his intelligence and integrity depend the very permanence of our institutions; *Socially*, it is from the bosom of the farmers' family that our most successful merchants and professional men come, and it is in his home are first planted those sturdy principles of truth and justice, which alone can make a truly great merchant or lawyer, and *physically*, it is the farmer who feeds all men, and is thus the *true* Atlas whom the ancients only knew in fable, and who carries the world on his shoulders.

Looking at these facts, all will agree with us that the American farmer occupies no ordinary position, and that the agricultural class demands the consideration and attention of the statesman, the moralist and the political economist of the present day.

In countries where the real farmers are serfs, ignorance of all but the merest manual labor is almost a necessity.

In countries where agriculture is secondary to manufactures or the arts, the government may be pardoned for treating it with some neglect.

In countries where despotism governs, and the sword is of more importance than the plow-share, the agriculturist earns his bread with groans, and seasons it with the sweat of his brow.

But in a republic, where nine-tenths of the sovereign people are farmers; where agriculture is the great business of life; where the arts of peace far outweigh the arts of war, wise men can never hesitate about the paramount interests of those who own and cultivate the land.

Gentlemen, there are two sorts of farming, and two eras in farming, known in the United States. In the first, the farmer wants little or no help from *science*; he requires only a strong arm, a willing hand, and the courage and tact of the early settler. Farming with him is a matter of hard labor, but certain reward, because that labor is applied to a virgin soil teeming

Digitized by Google

with fertility. His only embarrassment is, how to gather and what to do with his harvests. Manure is in his eyes an impertinence, the sub-soil plow a piece of useless folly, and he consoles himself for the malaria that he breathes, and the unsettled country that surrounds him, by cornfields, such as were never seen in Egypt, and prairies that seem bounded only by the horizon.

This condition of things and this era in farming still exists in much of the West, but in the Atlantic States even where it once existed, they have quite passed away, much of the soil was not *originally* so fertile, and a careless and improvident system of farming has exhausted the original fertility where it did exist. To add to the difficulties of the farmers of this and other sea-board states, the spirit of the age has sped on while they have been standing still, and has built railroads and telegraphs till time and space seem almost annihilated; hence the farmer of the Hudson or the Genesee finds that along side of his crops in the great market places, stand also the crops of the west, of as good quality and asking for buyers at lower prices. The farm no longer gives the former profit, and he finds his sons turning their backs upon civilization and the comforts of home because they must have either a new *way* or a new *soil;* or else abandoning the farm for the city, because there is not enough scope for a good head in a system of drudgery which produces only a scanty income.

This is the second stage in the history of our farming. The Atlantic States have already reached it, and some day or other even the western States will arrive at it. And now the question is, what is to be done? Shall the occupation of the farmer in such a great State as New-York, stand still as a mere ignorant routine? Shall soil which is capable of bearing the largest crops, be left to yield only half crops? shall the farmers' employment be looked upon as offering no scope for brains, and no return for enterprise, while the country is brimfull of energy, and all other professions and trades are alive with inventive industry, and creative genius?

Gentlemen, it has been said that the conquest of the world might have been foretold, from the mere structure of a man's hand. But to *conquer* a world is not much, unless we can *keep* it; and the world can only be kept, after a strong hand has conquered it, by a stronger head to govern it. All Europe has been startled and astonished, by the wonderful skill and rapidity with which the American farmer, with his axe in his hand, has conquered vast forests, has turned them into smiling fields and fruitful orchards, and has made great and populous States out of the primeval wilderness. Shall it be said that he is only a backwoodsman, that he can only subdue forests, that he can only gather large crops from soil fat with the

Digitized by Google

accumulation of ages, and that in short, though the best of pioneers, he is the poorest of cultivators?

I fear this will not only be said, but that we shall be obliged to admit the truth of the saying, unless the farmers and the law-makers, put their heads together, to devise some plan to help Agriculture out of this unhappy second stage, into which she has fallen in many parts of the country.

Agriculture, properly so called, considered as it should be considered, in the nineteenth century, is a complex and profound business. It is in the first place, the most practical of arts; and a man must stand firm on his legs, and understand the grip of tools, and dodge neither the wintry storm, nor the summer solstice, or he will find himself baffled in the open field, or the cattle yard. But this is not *all*. Besides this, it touches the whole circle of the sciences. To understand the growth of a single plant, he must dive into the secrets of chemistry and geology; he must explore the mysteries of the soil, the nature of manures, the composition of fluids and gases. He must study the physiological structure of vegetables, the food they require, the diseases that destroy, and the insects that devour them.

Now, gentlemen, without more than glancing at the many branches of science, some considerable knowledge of which is needful to make a really intelligent farmer, I must ask you to observe here, that if the farmer merely wished to learn these sciences as they are to be learned in books, and as they are taught in the schools, he would have no right to ask for especial schools of Agriculture. The academies of the country at large, might give him this kind of technical knowledge, just as they give him a knowledge of grammar, arithmetic, and geography. But experience has proved, that learning of this sort, is of little or no value to him. Nay, it is often worse than valueless; for it makes crochety experimentalists, instead of sound farmers And the reason of this is, that farming is no mere abstraction, no mere speculative science, no theoretical formula, but a real downright serious contest with nature; the end of which, is not to blow soap-bubbles, but to support men in a populous country, by making two bushels of wheat grow, where one grew before. For this reason it is, that Agriculture, in its largest scope, can never be thoroughly taught, either as a mere practical art, or a mere science. The common farmer may be the best mower that ever swung scythe; but he will lose, for a life-time, half the crops that his land would have yielded, from not knowing that his soil is deficient in lime. And a mere chemist will find himself as much at a loss, when suddenly forced to rough it on a common farm, as an Englishman does on his first day in Paris, who has only learned French from a book.

We often hear it said, that some of the farmers themselves, are opposed

Digitized by Google

to agricultural education. Honorable members of this Legislature, warmly in favor of an Agricultural School, tell me, that they have encountered such opinions, and found a spirit of opposition among the very farmers to be benefited by it. Farmers are naturally conservatives, combatting new things, even when they stand in need of them. And, along with many that are clear-headed on this subject, there are two sets of men who doubt and distrust. The first of these are merely *ignorant* farmers, who believe that improvements are altogether unnecessary; that to plant corn exactly as their fathers did, and plow their land with the same clumsy tools that their grandfathers used, is all that any *reasonable* being should *wish* to do. Gentlemen, I do not consider such men either real farmers, or real republicans. If God had intended men to be farmers without using any reasoning powers, he would have given them the perfect instinct of plowing and sowing. There would have been no need for improvement. The beaver builds his house, the squirrel secretes his store of nuts, and the bees make honey, at this moment, exactly as they did in the time of the Pharaoh's. But man, is endowed with reason, and a broad line of distinction between him and the animals is, that he has faculties given him expressly to enable him to *improve* the condition of the world within and around him. All that can be done with this class of objectors, is simply to pray that the film may fall from their eyes, (as it certainly will from those of their children,) so that they may look upon progress, as the real purpose of life.

The second class of doubters of the value of an agricultural education are entitled to more respect, for their dissent has a show of reason in it. It is composed of farmers whose observation has shown them, and perhaps whose experience has proved to them, that it is not *easy* to apply science to farming; they see a neighbor who has burned his crops with guano, and ruined his soil with lime; or who has, perhaps, raised better crops than they, but who has put less profit in his pocket by his new fangled manner than they have by the good old way. The result of this kind of observation has been, that they condemn science altogether, because they have seen failures made in carrying theories into practice by persons who either do not comprehend the one, or are not familiar with the other.

And so, gentlemen, by objections like these, we are brought to the issue at last. It lies in a nut-shell. How is the agriculture of this country, and especially of this State, to be really and permanently improved? Mere routine farmers will never improve it; they go on in the old way, while their lands are growing less and less productive—mere dabblers in science will never improve it; when their barns are full, their pockets are empty.

Digitized by Google

Yet it is as undeniable that modern science is capable of giving a great lift to agriculture, as that steam will drive cars on a railroad. What is necessary, in the latter case, is to know how to direct and apply the power of steam; and, in the former case, how to direct and apply the power of science. Now, engineering is both a practical art and an intricate science. So is agriculture. And we have, therefore, no more right to expect a man to manage a farm by reading Liebig's Chemistry, than we would expect him to manage a steam engine by studying that complex machine in the dictionary of mechanics.

But let us suppose a complete school of agriculture, established in the midst of such a community as the farmers of New-York. In the first place, it should be a thoroughly practical school, and for this purpose it must have land enough to carry on all the operations and raise all the crops that are generally raised in the State. In the second place, it should have the best and most intelligent practical farmer that can be found; and by this I mean a man who thoroughly understands the whole manual art of farming, and who not only knows how to do his work handsomely and well, but how to keep his land in condition, and make his crops pay. In the third place, there should be workshops, with skilful mechanics in them, where so much of the use of tools as it is needful for every farmer to know, should be thoroughly taught. In the last place, there should be competent teachers of chemistry, geology, botany, the physiology of animals and plants, and the other sciences that have a direct relation to agriculture; and these teachers should be, not closet professors, who have only the pedantry of their science, but men of real knowledge and quick parts, who can, if needful, deliver their lectures in the wheat-field, and make them tell better than in the laboratory. There should, of course, be lecture rooms, lodging houses, barns, and outbuildings for stock, and every thing necessary to make experiments and to carry on farming in all its branches that belong to a northern country.

Such is the groundwork of a farm school large enough to be of some general utility to the State. But the great distinguishing feature of such a school is this, that it must be essentially a working school. A fixed amount of manual labor upon the farm—so many hours per day—should be the imperative and inevitable duty of every student, rich or poor. He should work in classes, under the direction of competent teachers, and should thus gradually master all the practical art of farming—should be able not only to plow, to mow, or cradle his acre, in the shortest time, but to lay his furrow, and swing his scythe, with the most perfect combination of skill and ease.

Digitized by Google

During all this time the in-door education has been going on. This system of half a day's work and half a day's study will keep his wits all the sharper, and prevent Jack from being a dull boy. But when he is familiar with the ordinary labor of farming, and begins to understand something of the science also, then he should be made to apply the one to the other. A lecture on soils should be followed by careful examination of those on the farm and in its neighborhood. A statement of the action of different animal and vegetable manures upon plants, should be accompanied by trials upon various crops, made on a scale large enough to show the real profit or loss, and accompanied by memoranda that will fix the whole process and result firmly in the mind of the pupil. In this way, science and practice would be melted into one substance, and all the dross of theory and impracticability would rise to the top and be cast aside.

I need not, gentlemen, go into all the details of such a school. I will not discredit your understanding so much as to suppose that you do not see at a glance that a real practical school of agriculture like this would turn out young farmers of a very different stamp from any that we have now. What they had once learned they would have had proved, and what they had once done they could do again. Having found just how much and how far the discoveries of modern science could be turned to profitable account in the business of farming, they would be ready to take hold of poor land and renovate it to fertility; or rich land, and get the most out of it, without robbing it of the power of future productiveness. A graduate of such a school should be able to raise the largest possible crops with the least possible outlay of manure and labor, and the smallest waste of the natural fertility of the soil.

This, gentlemen, is what I would call a practical school of agriculture. The education of such schools is as different from that of many of our colleges for young men and boarding schools for young women, as the education of a sea captain who has worked his way up from the foremast, is from that of one of his passengers. The one can manage his vessel in a tempest, and calculate his reckoning in an unknown sea, while the utmost that the other can do is to maintain the use of his legs, and not lose the respect of the steward.

And practical schools like this are by no means an experiment. Every country in Europe distinguished for its agriculture already possesses them, and in many cases they are supported by government. I have seen abundant proofs of their good results, not only in the highly improved and more profitable farming of pupils taught in such schools, but in the high salaries which such pupils command, and in the large premiums which are often

Digitized by Google

paid to such farmers to teach others what they had learned. England is the country where science is perhaps most *successfully* applied to farming; and I was told in England, during the past season, that the average wheat crop of the whole country had been raised from fifteen bushels to thirty bushels the acre, in the course of the last twenty years, since science and intelligence had been actually brought to bear upon the productiveness of land. In that country I went once over an estate of several thousand acres, from which, not many years ago, the best farmer in England could scarcely raise a beggarly livelihood, but which is now, by the judicious application of science, the most profitable and productive farm of its size in Great Britain. I have seen, in Belgium, farms of seven acres made to support a family in comfortable circumstances, and a farm of ten acres that produced more profit annually than most farms in New-York of a hundred acres.

Gentlemen—I need not point out to you the advantages which a great farm school like this, established in every one of the Atlantic States, would have upon the productiveness of the country at large. I need not say how much such schools would raise the condition of Agriculture, by indirect as well as direct influences. I need not say how much they would elevate, and give interest to the calling of the husbandman; and how many more men of talent would become farmers, when farming should appear to them, something to occupy their energies, intellect, and capital, as well as their lands. I need not say how much the education which a farmer's son would receive in such an institution, would enlarge and elevate all his faculties; how much more of the harmony and beauty of God's works it would reveal to him; how much it would elevate him in self respect; how much it would raise him in the social scale, and how much more facile and easy it would render the discharge of his duties as a man and a citizen.

All these are collateral streams that branch out of the great river of agricultural education, in a country where farming is the business of a whole continent.

And now, gentlemen, when we ask the Legislature of the State to aid us in establishing such a school, they will ask us what claim we have upon them, and why private institutions cannot answer the same end.

Our answer is this. Private means are not sufficient to provide such a practical school of Agriculture as I have suggested. Land is wanted, large buildings are wanted, books, implements, scientific apparatus are wanted; but above all, *men* of the right stamp are wanted to manage and conduct such an institution. Here, indeed, lies the real difficulty. Self-styled professors, smatterers in chemistry, popular lecturers on science, political doctors of arts, may be had by the dozen, and they hold their ser-

Digitized by Google

vices cheap enough. We want none of them. They would spoil more farmers than they would make. What such a school must have, is, I repeat it again, men of the highest talent in their respective departments, men who can not only propound a theory, and give a definition, but who can *vitalise* and demonstrate their teaching in practice. Such persons as these are not the straws and sticks that go floating about the eddies of every day life: they are the men who cast anchor, and find soundings, and rear aloft those light-houses of science, that illuminate the dark ocean of ignorance and error. These are the men we want for teachers and professors in our agricultural school; and these are the men whom nothing but a State institution, with a great purpose in it, sufficient materials to work upon, and a just estimate of the value of their services, can ever procure. Without such teachers, an agricultural school is worth nothing, and such teachers only the State can command.

I would repeat, in conclusion, that the farmers of New-York have the strongest claims upon the State for aid and support in establishing such a school. They have the republican claim, that as they out-number all others they ask for the greatest good of the greatest number; they have the claim of the economist, that as they are the largest producers of material wealth, they are therefore most largely entitled to consideration in its wise appropriation; they have the claim of their class, that while the State patronises colleges for the education of one-fifth of the people who practice the learned professions, it is bound not to neglect the vast majority who have no sufficient means of learning the most important of all professions; and, finally, they have the claim of land-holders, voters, tax-payers, who ask from the State only their just rights, viz: the opportunity of enlarging their knowledge and usefulness, and thereby adding to the productiveness and substance of the nation.

And now, I will only add, that I have the utmost confidence in the wisdom of the present Legislature, and its watchfulness of the true interests of the farmer. It is not the policy of a wise government to thwart its own interests, and overlook the welfare of the mass of its citizens; and, to keep the agricultural class of this country in the dark, in this clear morning dawn of science. would be as great an act of folly as to cut off the locks of a Sampson in whose giant strength lies the safety and prosperity of the State.

At the close of the address, on motion of Dr. Beekman, of Columbia, the thanks of the Society were tendered to Mr. Downing for his very able and appropriate address, and a copy of the same requested for publication.

Digitized by Google

The President, Mr. Prentice, then addressed the Society as follows:

The year for which I assumed the responsibility of the station in which I appear before you, has now drawn to a close, and I am happy to be enabled to come in accordance with usage, to surrender these vested honors, at your election to another—and to another, too, who none more than myself, can delight to honor.

The year which has closed has been one crowned with unusual blessings to us as a Society—to our State and the Nation.

In no previous year has the influence of the Society been more widely diffused or more beneficial—in none has the labor of the husbandman been more richly rewarded, or the general prosperity more advanced.

We hear of war and rumors of war in other countries, and even sections of our own have not been free from alarm, from domestic causes, but yet we sit under our own vine and fig-tree, without any to molest or make us afraid.

It is true that the Nation has been called to mourn the loss of a beloved Chief Magistrate; but it is also true that we mourn not as do others. Our loss is simply that of a beloved, a venerated individual—one of the people.

No commotion follows, and our country moves steadily onward under other administrations, equally strong in the confidence and affection of the people, and as *is* the wealth-producing and physical power, so forever will be the strength and safety of our political institutions, vested in the rural population—the agricultural community; and yet it is true, knowledge is the element of power.

How important then, the subject to which our attention has just been called, and how desirable that the influence of this Society should be felt in the cultivation of the mind, as well as the soil.

Great disappointment was felt last year by the friends of agricultural education that no efficient action was had by the Legislature in its favor, and now the hope is entertained that the recommendation of the Executive may meet a more favorable response in the establishment of an agriculural college and experimental farm.

The agricultural survey, too, of the several counties in the State, which has been so successfully completed, under the auspices of the Society, in Washington and Seneca, is believed to be a matter of the very highest importance, and well worthy a special appropriation by the Legislature.

This whole thing is entirely in the hand of the farmers, and shall the farmers themselves hesitate? Are they content to be forever hewers of wood and drawers of water, while their own money makes the task master —to have simply a veto upon the power which themselves create in every liberal institution of the land, and never to take the initiative?

Digitized by Google

It is true, "knowledge is power," and true too, that the power is with the farmer; but it is a negative, rather than a positive power—a power to protect from evil rather than lead to good—a kind of ponderous balance-wheel in political machinery—"a poor wise man in a city."

It is hoped that the time is not far distant when this shall be otherwise—when the farmer, though a farmer still, shall be able to measure arms with the *other learned* professions, and lead as well as guide and *insure*, the popular will and safety.

The Annual Show of the Society held near this city in September last, was not inferior to any preceding one. The attendance was, probably, larger than ever before, and so in most respects the exhibition. The number and amount of premiums was very much greater than ever before.

Encouraged by the bounty of the Society offered the successful, some of the articles exhibited, and many others, the product of the soil and skill of the State, are being sent forward to the great Fair in London, to compete with the soil and the skill of the world, and on trial, I trust, in due time to claim the bounty offered.

From the large receipt of funds at the Fair, it was hoped, notwithstanding the very liberal amount of premiums awarded, we should be enabled to add something to the investments of the Society, for though it has never been the policy of the Society to hoard its funds, yet a prudent forecast does undoubtedly suggest the propriety of adding to it when our receipts are largest, that our premiums may not, necessarily, be curtailed when they are less, as they may be at any time from uncontrollable causes. This hope would undoubtedly have been realized under any ordinary circumstances.

Through the reports which have been read, the financial condition of the Society has been made known to you. I need not therefore, recapitulate, and yet, perhaps, may be allowed to call your attention to a few important and peculiar items, which have this year, for the first time made a draft upon your treasury, and which will account for, it is hoped justify, its present condition.

It was supposed, the last year, that every necessary provision was made to secure the Society from all local expense atttending the fair and exhibition, and though the contractors discharged their obligations to the entire satisfaction of the officers of the Society, yet, in consequence of the almost unprecedented rain storm which occurred at the time, and which subjected the Society to several hundred dollars expense, and of several new features in the show; this proves not to have been the fact—and yet the deficiency is not far different from the most favorable of our former fairs, though the necessary local expenses have been very much greater. Among the pecu-

Digitized by Google

liar features to which allusion has been made, were the stalls for cattle and motion for machinery. The first cost something more than five hundred dollars, and the last two hundred and fifty. The last is thought to have been a very desirable addition to our shows and one that may profitably be repeated, but it is doubted, whether the first answered the expectation of any one, in point of convenience, while it did undoubtedly detract very much from the general appearance of the ground. Your officers would, therefore, respectfully recommend that it be dispensed with in future.

The thorough trial of plows which has, the last year, been made for the first time by the Society, has also subjected it to some hundred dollars expense, (about $300,) but it is believed to have been money well expended.

In none of the hurried trials before has there been anything settled in relation to this most important implement, while now, it is believed, some principles, as well as facts, have benn established, and that for some years to come it will not be necessary to repeat it.

Another important item was the purchase of a Tent, now the property of the Society, and though made at an expense of seven hundred and fifty dollars, it is yet thought to be a valuable acquisition to the Society, and it may, perhaps will, be doubted whether a wise policy will not ultimately lead the Society to adopt them altogether, in place of the expensive wooden structures which it has heretofore used, and then demolished.

These several extraordinary items, together with some increase in salaries, expense of analysis, and reporting, will account for the fact that, with much larger receipts than ever before, nothing has been added to the invested funds of the Society.

It is true, however, a much larger amount remains in the treasury than did last year at this time; but still, not so large that it has been deemed prudent to invest, lest as then, the Society should be driven to the necessity of selling its securities, or making a loan for current expenses. Invested funds, though with prudent management, desirable, are yet not the most desirable acquisitions for the Society.

Its more important ends, it is believed, to be steadily accomplishing, and while, as now, its affairs are administered by officers of your own electing, who are willing to devote their time and energies to its interests without stint or reward, they must be considered safe.

The duties of your presiding officer were assumed one year ago with very great diffidence—even reluctance, and only because it was not deemed either modest or respectful under the circumstances to decline them. They have, however, been rendered light and pleasant through the consideration and kindness of your very excellent board of Executive Committee, your in-

Digitized by Google

comparable Secretary, and managing officer, and able, discreet Treasurer. No organization could be better or more efficient, and whatever success has attended its administration, to them is the credit due.

And now, gentlemen, in taking leave of you as your presiding officer, I beg leave to tender renewed assurances of my high consideration for you as individuals and an association, and of my unabated zeal in the great objects of our organization, and as an earnest of my conviction that our interests in this connection are in safe hands, I present you your President elect, Mr. John Delafield, of Seneca—a name already identified not only with his own county, as its historian, but with all that is excellent in Agriculture as well as morals.

On taking the chair, Mr. Delafield, addressed the Society as follows:

Gentlemen, Members of the New-York State Agricultural Society:

The distinguished position in which I find myself placed by your favorable estimation, calls for the warmest acknowledgments. To preside over the deliberations of an institution in which the interests of more than three-fourths of the population of this State are interwoven, and by which they are influenced, is an honor of inestimable value, and a position as responsible as it is honorable.

In this view, the presiding officer may well entertain a doubt of his ability to fulfill entirely and well, the duties which devolve upon him. Happily the constitution of the Society has provided, not only the aid of an Executive Committee, but has retained the experience and judgment of their ex-Presidents as counsellors. With aid so strong, together with the experience of the estimable and efficient Secretary, I may hope, not only to preserve, but also to promote the important interests of the institution.

FARMERS: The present Chief Magistrate of this State has recently presented to the Legislature a fundamental truth, which should continue to vibrate upon every ear, until its full meaning is comprehended, and until conviction shall cause every tongue to confess that "*the cultivation of the soil is the foundation of all public prosperity.*" Let me repeat it, and let every farmer remember, that the "cultivation of the soil is the foundation of all public prosperity." Well, indeed, may it be said that it therefore presents the *highest* claim to the fostering care of government.

In numbers as well as in wealth the farming community far exceed all other classes combined; and yet it may be noticed how reluctant they have ever been to press themselves into notice, or claim participation in the benefits so often sought by and conferred upon other classes of men.

Two causes have naturally exerted influences producing this effect. One is easily understood by all acquainted with the life of industry and toil

Digitized by Google

which marks the farmer's course. Distant and apart from the pursuits of men collected and living in denser masses, he is free from the fascinating objects of speculative pursuits, or indulgence in the luxuries and charms of artificial life. Knowing as he must, and as is admitted, that political power belongs to, and must reside among the men of industry and labor, the farmer is content with the possession—indifferent as to its exercise.

Yet another cause has, until recently, existed, pressing, like an incubus, upon Agriculture. This art of Agriculture, like every other art, is dependent upon science; and the only branch of science which teaches the farmer the elements of matter; of his soils, his manures and his plants; was itself unknown until within the life-time of many who now hear me; or if known, was so allied to error and deceit, as to be confined to alchymists, astrologers and dealers in the mystic arts. Until within thirty years, Agriculture was an art upheld only by experiment, directed by chance—yielding effects from causes, or principles not understood. Any art thus struggling with error and doubt, could not, and did not, command much respect; and the farmer, though furnishing subsistence to mankind, felt his lot to be one of endurance, toil and drudgery.

As soon, however, as the misty clouds of ignorance had passed away, and the elements of matter were brought to light by science, the farmer's occupation began to take its position on a level with other arts, giving a dignity before unknown to such pursuits, and a condition as elevated and honorable as any allowed to man.

It must be gratifying to every member of the New-York State Agricultural Society, to trace the events of a few passed years, and mark the happy influences which have flowed from its steadfast, judicious course of action.

The establishment of an agricultural school and experimental farm has obtained a strong hold upon the minds of the people, and has received some attention from the Legislature. This subject has been forcibly presented to our minds this evening, and dull must be that understanding which does not heartily subscribe to the necessity for, and utility of such an institution to strengthen and maintain the foundations of all public prosperity. May we not hope that the present Legislative session will not pass away without the accomplishment of this important object?

GENTLEMEN AND FRIENDS OF THE STATE AGRICULTURAL SOCIETY, who are not members of the Institution, allow me to say, that cold is that heart which is not open to the impulses of pleasure, derived from approbation. As with individuals, so with this Society, it rejoices in your presence and kind expressions.

The thronged attendance upon its annual celebration, the interest mani-

Digitized by Google

fested at the winter meetings, are an evidence of benefits derived, and evidence of advantages and of good as well as pleasure conferred. Above all, they exhibit a happy bond of union between the producer and consumer; a mutually dependent interest, shedding the happiest influences on society; influences springing from labor, which is the only true source of wealth and happiness; from labor which receives its recompense in the abundance and fruition of the countless objects of use, comfort and innocent pleasure, which are profusely proffered by every art and science.

With these views, it will be my endeavor to keep these influences in active exercise; that they shall neither slumber nor sleep, but tend, as I trust, to give an accelerated motion to the onward progress of this most useful public Institution.

On motion of Col. L. G. Morris, a vote of thanks was tendered to E. P. Prentice, Esq., late President, for his able and valuable services during the past year; and also to the other officers of the board, for the satisfactory manner in which their duties have been discharged.

On motion of L. F. Allen of Erie, a committee of five was appointed to make application to the Legislature, for the establishment of an agricultural school and experimental farm; and that a memorial be prepared and presented at as early a day as practicable.

The President appointed Mr. Prentice, Dr. Beekman, B. B. Kirtland, Mr. Tucker, and Mr. Johnson.

Very interesting remarks in favor of the establishment of a school and farm were made by Hon. O. Allen, Hon. George Brayton, Hon. Mr. Tuthill, Hon. Mr. Fordyce, of the Assembly; by Gen. Viele, and Hon. A. Osborn.

Mr. Allen, of Erie, in the absence of the chairman of the committee, to whom was referred the claimed discoveries of Russell Comstock, of Dutchess co., on vegetation, reported, after a conference with Mr. Comstock, that the committee came to the unanimous opinion that no new discovery had been made by Mr. Comstock, nor was his practice different from that of experienced nursery-men heretofore, and which may be found described in public works—and although important in themselves, the committee do not deem it proper for the Society to recommend to the Legislature any appropriation to Mr. Comstock as the discoverer.

The report was accepted and adopted.

On motion of Mr. Johnson, the thanks of the Society were tendered to the Hon. the House of Assembly, for the use of their halls for the meetings of the Society. Adjourned. B. P. JOHNSON, *Secretary*.

Digitized by Google

STATE AGRICULTURAL ROOMS,

EXECUTIVE MEETING—NEW BOARD OF OFFICERS, JANUARY 17TH, 1851.

Present—John Delafield, *President*. John P. Beekman, John M. Sherwood, Lewis F. Allen, E. P. Prentice, *Ex-Presidents*. A. Van Bergen, H. Wager, Hon. S. M. Burroughs, Benj. Enos, *Vice Presidents*. B. B. Kirtland, M. G. Warner, A. Stevens, *Executive Committee*. Luther Tucker, *Treasurer*. B. P. Johnson, J. McD. McIntyre, *Secretaries*.

The Corresponding Secretary, Mr. Johnson, was designated as the acting Secretary, to take charge of the rooms and general business of the Society.

The expenses of the survey of Seneca county, by Mr. Delafield, were presented and referred to Mr. Allen, Mr. Prentice, and Mr. Tucker, and on their report audited.

On motion of Col. J. M. Sherwood, it was resolved, that the next State Fair of the Society be held at or near the city of Rochester, on the 16th, 17th, 18th and 19th of September next; on condition that on or before the 6th of February next, a valid agreement or bond be deposited with the Secretary of the Society, satisfactory to the Executive Committee, conditioned that the erections and arrangements for the exhibition, similar to those at Albany in 1850, (excepting steam power and stalls for cattle,) be provided by the citizens of Rochester, without expense to the Society.

The Secretary was directed to prepare a copy of the several requirements as made at Albany, and furnish a copy of the same to the citizens of Rochester.

Mr. Prentice, Mr. Tucker, and Mr. Johnson, were appointed a committee on printing Transactions.

Mr. Prentice, Mr. Downing, and Mr. Morris, were appointed a committee to procure from Mr. *Townend Glover*, of Fishkill Landing, samples of his specimens of fruits for the Agricultural Museum, to the amount of $50.

Mr. Delafield, Mr. Enos, and Mr. Johnson, were appointed a committee with power to make arrangements for a survey of the county of Madison, should a suitable person to make the survey be found, and the terms such as would be satisfactory.

A resolution was adopted, asking from the Legislature the appointment

Digitized by Google

of an agent as recommended by the Governor, to take charge of the articles from this State, entered for the industrial exhibition in London, and to report such matters of interest to the people of the State as may come under his observation at the exhibition. The Executive Committee were appointed to attend to the subject embraced in the above resolution.

The premium list was taken up for consideration, and completed, and 1000 copies ordered published in the Journal of the Society, and copies to be furnished to the presidents of county societies, and the Executive Committee adjourned. B. P. JOHNSON, *Secretary.*

Monthly Meetings.—The Executive Committee will hold their monthly meetings on the first Thursday in each month, at the Agricultural Rooms.

REPORTS OF COMMITTEES AT ANNUAL MEETING, JAN., 1851.

BUTTER AND CHEESE.

Committee—Henry Wager, Oneida; J. W. Ball, Otsego; N. D. Collin.

The committee have examined the samples of butter and cheese presented for premiums, with much interest, and are happy to state, that on butter the competition was very spirited, there being a number of competitors, and all the samples shown were of great excellence, being of superior quality, and entitling the manufacturers and exhibitors to the thanks of the Society, showing as they do great improvement in the article from year to year.

In cheese, the committee regret that there was not more competition.

The following entries of butter were made:—Roswell L. Colt, Esq., Paterson, N. J., jar of Alderney butter; J. T. Lansing, Watervliet, 3 tubs of butter; Lewis E. Smith, Mechanicsville, Saratoga county, 3 jars of butter; Noah Hitchcock, jr., Homer, Cortland county, 3 tubs of butter; Ela Merriam, Leyden, Lewis county, 3 tubs of butter; Philip Lasher, Saratoga, 3 tubs of butter; Joseph Cary, Albany, 3 tubs of butter; Nelson Van Ness, Chautauque county, 3 kegs of butter; Horace Clapp, Lewis county, 1 tub of butter.

The committee award the first premium, Silver cup, $15, for butter exhibited, by E. Merriam, Leyden, Lewis county; the second, cup, $10, for butter exhibited, to Joseph Cary, Albany; to Nelson Van Ness, Chautauque, and Noah Hitchcock, jr., Cortland county, volume Transactions to each.

A sample of very superior butter was shown by Horace Clapp, of Lewis county; but, as only one tub was exhibited, it did not come within the rules of the Society, and a premium could not be awarded as we desired.

The committee take great pleasure in noticing a very fine sample of very

Digitized by Google

superior *Alderney butter*, from Roswell L. Colt, Esq., Paterson, N. Jersey, which has been examined by the officers of the Society, as well as many eminent judges of the article, besides the committee—and all pronounce it superior in flavor and color to any sample offered for exhibition. This sample was made a short time previous to the exhibition; the cows being kept on dry feed. A Diploma is recommended to Mr. Colt, with the thanks of the Society.

The committee award to Robert Eells, of Oneida county, the second premium, $10, on cheese. The first premium is not awarded to any of the competitors, as the samples offered do not bear that uniformity of excellence which should prevail in every dairy, to entitle the competitor to the first premium. It is hoped that another year will witness a more extensive competition, as well as superiority of manufacture, worthy of the character of the dairies in this State.

WHEAT AND OATS.

Committee—John B. Burnet, Onondaga; Daniel S. Curtis, Columbia.

The committee appointed to examine applications for premiums on crops of wheat and oats, have examined the statements presented and have awarded the premiums as follows:

Winter Wheat.—1st prem. $20, to Wm. Hotchkiss, Lewiston, Niagara co., 63½ bu. per acre, (Soules wheat,) on 6¾ acres. 2d—$15, Samuel L. Thompson, Setauket, L. I., 42 bu. 10 qts. by measure and 44 bu. 24 qts. by weight, per acre, (Australian wheat.) 3d—$5, Justus White, Pamelia, Jefferson co., 40 bu. 2 pecks per acre.

Oats.—1st. $15, H. B. Bartlett, Paris, Oneida co., 88 bu., 14 qts. per acre, (Barley oats). 2—$10, George H. Eells, Clinton, Oneida co., 87 bu. 3 qts. per acre. 3—$5, H. B. Bartlett, Paris, Oneida co., 84 bu. 21½ qts. per acre, (common white oats). E. M. Bradley, East Bloomfield, Ontario co., 83 bu. 7 qts. per acre.

WILLIAM HOTCHKISS' STATEMENT, LEWISTON, NIAGARA CO.

Statement relative to a crop of *wheat* raised in the town of Lewiston, county of Niagara, harvested in the month of July, 1850, viz:

1st, The previous crop raised on the field was wheat, harvested in the year 1848, yielding about twenty bushels per acre—received no manure for several years previous, excepting from the breaking up of a clover meadow, the wash from the public road above, and from a ravine making into said field.

2d. The soil of said field is mostly of black loam, the west part from

Digitized by Google

one and a half to two acres, is a gravelly soil. The said farm lies about one mile east of the village of Lewiston, on the north side of what is generally known as the Niagara or Ridge Road, leading from Niagara to Rochester, and with quite a descent from the said road on to said farm.

3d. There was drawn on to two and a half acres of the west end of said field fifty loads of barn-yard manure, well rotted, the remainder of the field received no manure—the manure was spread, the last of August, 1849, and was landed up into six pace lands, at the same time plowing in said manure. Forty bushels slacked lime was then spread over the field and thoroughly harrowed in. The quantity of seed sown, was two bushels per acre, and was of the Soule's variety.

4th. Said field sown the 7th September, 1849, drilled in by a drilling machine, invented by Mr. Abbott, of Lockport, in said county. The crop was cut with a sickle, was thrashed by Emery & Co's., (Albany) Rail Road Horse Power and Thrasher, the wheat was run through a fan mill, actually measuring 385 and ¾ bushels, as sold to my neighbors for seed, excepting a small portion reserved for my own use for seed purpose. The net value of the wheat was $1 per bushel.

Expense of Cultivating the Crop.

Fall plowing, 1848, 3 days, man and team at $2 per day	$6 00
Cultivating and harrowing, June 1849, 2 days man and team,.....	4 00
Cross plowing and harrowing part of Aug. '49, 4 days man and team	8 00
Drawing on manure from barn-yard, 3 men and team.....	7 00
Three days spreading manure, one man, 6s. per day.....	2 25
Plowing in, landing up into six pace lands, 3 days man and team..	6 00
Forty bush. lime from kiln, spread on field one day, man and team	2 00
Hauling lime and spreading same, one day, man and team.....	2 00
Harrowing in lime one day, man and team.....	2 00
Drilling in wheat, one day man and team.....	2 00
Furrowing out, keeping water courses clear	1 50
	$43 55
Interest on land should be added, say	3 50
	$47 05

Manure and lime should also be added, the expense.

Affidavit of Surveyor.

NIAGARA COUNTY, *ss:* Isaac Colt being duly sworn, deposes and says, that he surveyed with chain and compass, the land upon which William

Digitized by Google

Hotchkiss raised a crop of wheat the past season, and the quantity of land is six acres and $\frac{13}{100}$ of an acre, and no more.

ISAAC COLT, *Surveyor.*

Sworn to, before me, this 25th day of December, 1850.

JOHN D. BYRNE, *Justice of the Peace.*

NIAGARA COUNTY, *ss:* William Hotchkiss being duly sworn says, that he raised a crop of wheat the past season upon the land surveyed by Isaac Colt, and that the quantity of grain raised thereon, was 385¾ bushels, measured in a sealed half bushel, which had been repaired; but that the wheat so measured, would overrun, 60 lbs. to the bushel; and that he was assisted in harvesting, thrashing and measuring said crop by Hiram S. Root, and that the statement annexed, subscribed by this deponent, as to the manner of cultivation, expenses, &c., is in all respects true, to the best of his knowledge and belief, and that the sample of grain exhibited, is a fair average sample of the whole crop.

WILLIAM HOTCHKISS.

Sworn to, before me, this 25th day of December, 1850.

JOHN D. BYRNE, *J. P.*

NIAGARA COUNTY, *ss:* Hiram S. Root being duly sworn, says, that he assisted William Hotchkiss in harvesting, getting out and measuring his crop of wheat referred to in the above affidavits, and that the quantity of grain was 385¾ bushels, as stated in the affidavit of Mr. Hotchkiss.

HIRAM S. ROOT.

Sworn to, before me, this 25th day of December, 1850.

JOHN D. BYRNE, *J. P.*

SAMUEL L. THOMPSON, SETAUKET, L. I.

Statement of Crop of Australian Wheat.

1st. The land on which the wheat was raised was a sandy loam, and somewhat exhausted by the previous cropping, and lies at Setauket, in the town of Brookhaven, Suffolk county, Long Island; contained two acres.

2d. The crops previous to the wheat, were two crops of Indian corn, manured in the hill, followed by a crop of oats, without manure.

3d. Thirty loads of barn-yard manure, (30 bushels estimated for a load,) applied to the acre, and plowed under; and 150 lbs. of Peruvian guano per acre; a bushel and 12 quarts of golden Australian wheat was sown broadcast to the acre, on the 23d September, 1849, and harrowed in.

4th. The weat was reaped with the sickle, on the 15th July, 1850, (it

Digitized by Google

stood until entirely ripe for seed,) thrashed with a machine, and cleaned with a fanning mill. The yield was 84⅓ bushels, four quarts, and one pint, from the two acres, measured in a scaled half bushel; weighing 63½ lbs. to the bushel, being 89½ bushels by weight. The expense of cultivating the crop was:

Barn yard manure, per acre,	$25 00
Guano, per acre,	3 75
Plowing, carting manure, and preparing the ground for seed, per acre,	5 00
Harrowing, thrashing, &c.,	5 00
Seed, per acre,	6 87½
Per acre,	$45 62½
Interest on land, at $50 per acre,	3 50
	$49 12½

The wheat was sold for seed, at $5 per bushel, and the straw was worth $5 per acre.

(The market value of the wheat would be the proper criterion as to the profit of the crop, and that would not be over $1.12 to $1.25 per bushel; but an allowance should be made as to the expense of cultivation, of such portion of the manure unexhausted, as would be beneficial to the succeeding crop.)

The affidavit of John F. Hammond, surveyor, as to the quantity of land, of Messrs. Thompson & Henrick Kraking, as to the measure and weight of the wheat, were furnished as required by the regulations of the Society.

JUSTUS WHITE, PAMELIA, JEFFERSON CO.

Statement of four acres of Genesee Bald Wheat.

Mr. White's land is a black, gravelly soil, summer fallowed, plowed three times and well harrowed; twenty-five loads of barn-yard manure per acre, (thirty bushels to the load,) plowed in at the second plowing; two bushels of seed per acre, sown on the 4th of September, 1849, broadcast and harrowed in; harvested on the 25th of July, 1850, and thrashed with a machine; yield was 162 bushels—40½ bushels per acre.

Expense of cultivation per acre:—

Digitized by Google

Plowing and harvesting,	$5 00
Seed and sowing,	3 00
Harvesting and thrashing,	5 00
Interest on land,	3 00
	$16 00

Manure, carting, and spreading, should be added to the above.

Mr. White sold his wheat for $1.25 per bushel for seed.

(The statement of Mr. White is verified by his own affidavit, and the affidavits of Lysander Van Bracklin and Jacob Boensteel.)

OATS.

HENRY B. BARTLETT, PARIS, ONEIDA CO.

Statement of Crop of Barley Oats—Two acres.

Soil, muck and loam; previous crop, oats; plowed about eight inches deep; no manure the present season. Sowed May 11th, three bushels of seed per acre; harvested August 7th, with cradle and sickle; thrashed with machine, Dec. 16th—yield, from the two acres, 176 bushels and 29 lbs.; 88 bushels, 14½ lbs. per acre; (weighed 38 lbs. to the bushel.) No extra labor or expense to produce the crop—the whole field treated alike. The whole expense of the crop, including the interest on the land, $11 per acre. The value of the oats, fifty cents per bushel:

Making, for the two acres,	$88 30
Value of the straw,	5 00
	$93 30

(The statement of Mr. Bartlett, verified by his own affidavit, and of the surveyor, Chauncey S. Butler, Stephen Minter, and George Garrow, who assisted in harvesting, thrashing and measuring the oats.)

GEORGE K. BELLS, CLINTON, ONEIDA CO.

Statement of two acres and seven rods of Oats.

Soil, loam and gravel, in good condition; previous crop, spring wheat; part of the field had a very little manure, the rest without manure the present season. Plowed the last of April, eight inches deep; six bushels of seed upon the piece, and covered with a two horse cultivator; harvested the

Digitized by Google

middle of August; thrashed in September, with machine—yield, 178 bushels; sold for fifty cents per bushel,.....	$53 40
Six loads straw.....	12 00
	$65 00
Expense of cultivation, for the whole piece,.....	$18 14
Interest on land,.....	5 60
	$23 74

(The proofs as required by the rules of the Society.)

H. B. Bartlett, *Crop of common Oats*—169 bushels, 11 lbs., on two acres. Method of cultivation same as in his statement of the barley oats.

Elisha M. Bradley, East Bloomfield, Ontario county, produced proofs, as required by the rules of the Society, of having raised, on $2\frac{64}{100}$ acres, 220 bushels of oats. Soil, a loam, in some places mixed with gravel; $3\frac{1}{2}$ bushels of seed sown per acre; plowed 10 inches deep; seed sown broadcast.

INDIAN CORN.

Committee.—Hon. Orlando Allen, Erie; Hon. Smith Stilwell, St. Lawrence; Lewis E. Smith, Saratoga.

The committtee having carefully examined the statements submitted to them, report: That Peter Crispel, jr., of Hurley, Ulster county, has exhibited proof, agreeable to the rules of the Society, of having raised $200\frac{2}{32}$ bushels of sound shelled corn upon two acres of ground, and has furnished a statement of the management of his crop and the expense of cultivation. The 1st premium of $20 is awarded.

Robert Eells, of Westmoreland, Oneida county, having exhibited like proofs and statement of having raised $168\frac{32}{50}$ bushels on two acres, the 2d premium of $15 is awarded.

Seymour Foster, of Hillsdale, Columbia county, exhibited satisfactory evidence of having raised upon one acre $97\frac{18}{32}$ bushels of shelled corn. The rules requiring at least two acres to be measured, no premium can be awarded, though it appears that Mr. Seymour had several acres in his field apparently as productive as the one measured.

John Binnse, of Jefferson co., produced evidence of having raised 560 bushels of shelled corn on $8\frac{9}{10}$ acres; and George H. Knapp, of Stanford,

Digitized by Google

Dutchess co., 70 bushels from one acre, from a field of 20 acres, the whole of which was cultivated in the same manner.

Eli R. Dix, of Vernon, Oneida county, presented statements showing a very large yield of corn from two acres and upwards, but as only a portion of the crop was shelled, no premium can be awarded.

The committee are fully satisfied from the statements presented, as well as from their own observation, that upon land properly prepared and cultivated, the crops for which premiums are awarded may and should be equalled and even excelled, in the corn growing districts of our State.

PETER CRISPEL, JR., HURLEY, ULSTER COUNTY.

Statement of two acres of Corn, $100\frac{1}{32}$ *bushels per acre.*

The condition of the soil on which I raised my crop of corn the past season and its method of cultivation, for which I claim a premium.

It was a lot of meadow which had not been plowed since the year 1837, and has been mowed every year since that time. It was manured with about 15 loads of manure (from horse stable and dry manure from the barnyard,) to the acre, the grass which was mostly clover (the timothy having been taken out by the grub-worm two years ago,) was permitted to grow without being pastured until the 28th day of May, when it was plowed in with the manure. It was harrowed down and marked for planting on the 29th, and planted on the 30th day of May, and marked about two feet eight inches distant both ways; planted in hills, the plowing was about eight inches deep with a lapped furrow neatly turned over. The corn came up in five days after planting, and before cultivating there was about 200 bushels of leached ashes put on, sown broadcast over the land. The number of kernels dropped in each hill was three to four, and when the corn was large enough to be seen through the rows, it was worked with a cultivator both ways, which cleared out the land without any harrowing, and when the corn got about a foot high it was plowed and then hoed and thinned out. The variety of corn planted was the small eight-rowed yellow, a little less than half a bushel planted on the two acres. The stalks were cut on the 10th and 11th days of October; the corn was husked on the 27th, 28th and 29th of October, and the stalks were brought in on the 5th and 6th days of November, when they were all weighed and the weight of them was 16,410 lbs. A full estimate of the value of corn stalks cannot, I think, be less than one-half that of hay by weight, which will make the worth of my stalks from two acres to be about $41, hay at our place being worth at present $12 per ton, and sold from the meadow in harvest at $10 per ton, so that stalks may be fairly estimated at $5 per ton, and I am certain that at

Digitized by Google

that price stock can be fed much cheaper than on hay at the price above stated. The corn was shelled from the 20th to the 27th of December, inclusive, and measured on the 23d, 24th and 27th of December.

Expense of raising crop.

To one day's work with team, plowing,	$2 00
Drawing out manure,	4 75
Harrowing, furrowing, and planting,	2 00
Cultivating, plowing, and hoeing,	2 75
Cutting up corn,	2 00
Husking and sorting,	5 00
Shelling,	2 50
Value of manure,	15 00
Value of ashes,	22 00
Interest on land,	14 00
	$72 00
Value of corn, (partly sold,) 5s and 6d per bushel,	$137 54
Value of stalks,	41 00
	$178 55
Net profit,	$106 54

The weight of my corn when shelled, was 58 lbs. to the bushel.

PETER CRISPELL, Jr.

Dated, *Dec.* 28*th*. 1850.

(The affidavit of Mr. Crispell, John Ten Eyck, surveyor, and William Dubois, who assisted in harvesting, shelling, and measuring the crop, accompany the statement, as required by the rules of the Society.)

ROBERT EELS, WESTMORELAND, ONEIDA COUNTY.

Statement of two acres of corn, yield $168\frac{32}{58}$ *bushels.*

The soil is a gravelly loam, in good condition; with a previous crop of hay for six successive years, without manure. The land was plowed early in April, soon after the frost was out; and it froze up again after plowing; was plowed eight inches deep, and twelve wide, furrows lapped. The land was harrowed with a common double harrow first, and then with a steel tooth cultivator, previous to planting. The land was then marked out one way with a corn marker, three feet and four inches apart, except three-fourths of an acre, which was furrowed with a plow, deep as possible without tearing up the turf. We designed to have the hills two feet and six inches

Digitized by Google

apart, and the rows three feet and four inches, as near as possible. The corn was planted the 15th, 16th and 17th of May, appeared above ground in six days; the number of kernels dropped in each hill, from five to seven; the number of stalks designed to be left is four in each hill. The variety of corn planted is the twelve and sixteen-rowed Dutton corn, with eight quarts to the acre. There was eight loads of hog manure used on the crop, about three-fourths of an acre was furrowed out deep with a plow and the eight loads of hog manure put in the hills, no other manure on the crop; hoed twice, the cultivator also having been passed twice in a row previous to hoeing each time; stalks topped the third week in September, yielding two loads, valued at least ten dollars. The corn was cut up near the ground between the middle and last of October, and drawn to the barn and husked, thereby saving all the husks and stalks for fodder, which will much more than pay for the extra labor of cutting up and drawing, valued over extra labor, five dollars. The corn was shelled December 27th, 28th and 30th, and sold to A. B. Clark, Clarksville, Oneida co., for 50 cts. a bushel.

Expense of Cultivation..

Two days plowing,.....	$4 00
One day harrowing and marking,.....	2 00
Seed,.....	50
Four days planting,.....	3 00
Eight days hoeing,.....	6 00
Two days topping stalks,.....	1 50
Eight days harvesting,.....	6 00
Six days shelling,.....	4 50
Eight loads of manure,.....	4 00
Interest on land,.....	5 60
	$37 70

Proceeds.

168 32-56 bushels corn at 50c., ...	$84 28	
Stalks,.....	15 00	
		$99 28
Expense,.....		37 70
$30 79-100 per acre		$61 58

(The affidavit of Mr. Eells, of Oren Root, surveyor, and of Patrick Cassen and Simon Hatch, who assisted in harvesting, shelling and measuring

Digitized by Google

the corn, accompany the application, as required by the rules of the Society.)

POTATOES AND ROOT CROPS.

Committee—E. N. Pratt, Rensselaer; A. Osborn, Albany.

Potatoes.—The committee on potatoes and root crops, beg leave respectfully to report, that they award the first premium to Mr. H. B. Bartlett, of Paris Hill, Oneida co., for the best crop of one acre of potatoes of good table quality, and for his manner of cultivation refer to his written statement annexed—$15. This is the only premium awarded in this class, quality and quantity both considered.

They award the first premium to Nathan Taft, of Pittstown, for the best crop of one acre of potatoes as to quantity only, 325 bushels per acre, and likewise refer to his written statement for particulars as to cultivation, &c.; $15.

Your committee have examined with much satisfaction several varieties of potatoes exhibited by Mr. George Vail, of Troy, grown from tubers procured from the Agricultural Rooms, from the Secretary of your Society, some of which having every appearance of being of superior quality, are decidedly valuable for cultivation.

Ruta Baga's.—They award the first premium to Mr. Valentine H. Halleck, of Northeast, Dutchess county, for the best crop of one acre of Ruta Bagas, 1,015 bushels; $10.

Mangel Wurtzel.—There has been no competition for mangel wurtzel beets, with exception of Alfred Fitch of Riga, and his statement covers but a quarter instead of half an acre, as the rule requires, which prohibits an award in his case.

Carrots.—They award the first premium on the best crop of half an acre of carrots to E. Risley & Co., of Fredonia; $8.—1 acre, 951 bushels. Second premium to Mr. N. Hayward, of Brighton, near Rochester; $6. Half an acre, 431 bushels.

Cauliflowers.—They recommend an award of one volume of Transactions to Mr. John S. Goold, of Albany, for cauliflowers of very superior character, and also, to Mr. Lewis E. Smith, a volume of Transactions for cauliflowers of a remarkable description.

H. B. BARTLETT, PARIS, ONEIDA COUNTY.

Potatoes—304 bushels per acre.—Method of Cultivation.

Soil, muck, previous crop potatoes. Plowed once, May 20th, about ten inches deep, used no manure on the land, except what was put on each hill

Digitized by Google

when planting, viz: *a table spoonful of lime, plaster and ashes.* The land was dragged and marked the rows with plow, about three feet apart. Planted May 31st, in drills about twelve inches apart. I cut the potatoes, and used one piece in each hill (about 16 bushels per acre before they were cut). After the potato is dropped, I use the lime, plaster, and ashes; this is done to secure them from the rot. I have practiced it several years with much success. It has proved a great benefit to my crop. The present season, on a portion of my ground potatoes were planted without using the above mixture, and these have been affected with rot so as not to be worth digging. I am satisfied that this preparation has in my own case saved my potatoes from disease to a very great extent, and has very largely increased my crop when used.

Expense of cultivation, ...	$32 50
304 bushels of potatoes, 3s per bushels,.....	114 00

(The statement of Mr. Bartlett is accompanied with the affidavits required by the Society.)

NAHUM TAFT, PITTSTOWN, RENSSELAER COUNTY.

325 *bushels per acre of sound Potatoes*

Mr. Taft's land was a gravelly loam—rolling land, with an eastern descent. It had been in pasture for two years. Ten ordinary cart loads of barn-yard manure spread upon the piece and plowed under. Planted 15th of May, in hills two feet by three feet. The potatoes were cultivated with cultivator twice and hoed once.

Whole expense of cultivation, including interest on land,	$24 18
Potatoes at 44 cents per bu., the market price,.....	143 00

About ten bushels of diseased potatoes which were not measured.

(The statement of Mr. Taft is accompanied with the affidavits required by the rules of the Society.)

VALENTINE H. HALLECK, NORTHEAST, DUTCHESS CO.

Ruta Bagas—1015 *bushels per acre.*

Soil, a gravelly loam, and inclining towards the east. The field has been laid down for the last ten years in grass, and the crops taken off without the use of manure during that time. Ten loads of compost, composed of six loads common barn-yard manure, three loads of the scrapings of the bottom of charcoal pits, ten bushels of night soil, four bushels quick lime, ten bushels of ashes, three bushels of plaster, allowed to heat for fifteen days previous to use.

Cultivation.—The land turned over as early as the condition of the soil would admit, about seven inches deep, a steel tooth cultivator is used working the soil as deeply as possible without disturbing the sod. The manure

Digitized by Google

is then spread and harrowed with a fine tooth harrow, until it is thoroughly incorporated with the soil—seed drilled in the 27th June, twenty-seven inches apart. The quantity used, one lb. per acre. The seed is covered by a chain, the ends of which are fastened each side of the drill—and then rolled with a light roller. When the plant attains four or five leaves, I pass through with a three toothed cultivator once in a row—and commence thinning in about ten days with a broad hoe, to about eight inches in a row, which takes out all weeds left by the cultivator. The cultivator is used twice more working as deeply as possible. In harvesting, gather them as dry and free from dirt as practicable. Harvest last of October.

Expense of cultivation $17—manure $7,.....	$24 00
Value of Ruta Bagas, 18 cents per bushel,.....	182 70

(Proofs as required, accompany Mr. Halleck's statement.)

TIMOTHY SEED AND TOBACCO.

Committee—Hon. James Farr, Washington; James McIntyre, Albany; A. Osborn, Albany.

The committee awarded the first premium on *Timothy Seed* to Robert Eells, of Oneida county, for the best sample exhibited, 7 bushels and upwards per acre, $5; and the second premium, of $3, to George K. Eells, of the same county, for 7 bushels 20 quarts on an acre and 3¼ rods of land.

Tobacco—1st premium, of $5, is awarded to M. G. Warner, of Rochester, for a very fine sample of tobacco.

The committee deem it their duty to state the fact, that in many parts of this State tobacco can be raised as a remunerating crop. Crops of from 1,200 to 1,500 lbs. per acre have been raised by thorough cultivation, and at a cost, it is believed, not exceeding many crops now produced.

MAPLE MOLASSES.

H. B. Bartlett, of Paris, Oneida county, exhibited some maple molasses, which had been made upwards of a year, which retains, in entire perfection, its fine maple flavor. A committee, consisting of Lewis F. Allen, A. J. Downing, and Lewis G. Morris, recommend a special premium, of $10, which was awarded by the Executive Committee.

Digitized by Google

BARLEY, BEANS AND PEAS.

Committee—Hon. Benjamin Enos, Madison; Thomas Bell, Westchester.

The committee report, That there were three samples of barley presented for examination. The first was from Elisha M. Bradley, of Ontario county, the sample was good and well cleaned, the quantity was 106 bushels, from two acres of ground, equal to 53 bushels per acre. The necessary certificates, required by the rules of the Society, are properly made. The committee therefore award to Mr. Bradley the first premium, of $15.

The two other samples exhibited were from E. R. Dix, of Vernon, Oneida county; and William Baker, of Lima, Livingston county.

Mr. Dix states that he raised 133 bushels, by measure, on three acres, equal to 44⅓ bushels per acre; and Mr. Baker states that he raised 100 bushels, by measure, on two acres, equal to 50 bushels per acre. The committee being satisfied that there was a great difference in the samples presented by the competitors, proceeded to examine them by weight, and after a careful examination, found that the barley of Mr. Dix weighed 50 lbs. to the bushel, while that of Mr. Baker weighed only 45½ lbs. to the bushel, which made them stand as follows:

Mr. Baker, 100 bushels by measure—by weight 94$\frac{38}{48}$ bushels, equal to 47$\frac{19}{48}$ bushels per acre.

Mr. Dix, 133 bushels, by measure—by weight 138$\frac{26}{48}$ bushels, equal to 46$\frac{7}{48}$ bushels per acre.

Mr. Baker having over Mr. Dix, one bushel and ten pounds per acre.

Your committee are of the opinion that the interest of the Society requires, that the quality and condition of the various crops presented should be taken into the account, in awarding premiums, as well as the quantity; and as the condition of the barley belonging to Mr. Dix was far superior to that of Mr. Baker, and more than sufficient to overbalance the difference in quantity, your committee therefore award to Mr. Dix the second premium, which is $10; and the third to Mr. Baker, which is $5.

Of *Beans* there was but one sample presented, and that was by Mr. Asahel R. Dutton, of Delaware county. The crop was 44¾ bushels of the small white bean. The quantity of ground was one acre, one rood, and thirty-one rods of ground; making the crop 30$\frac{29}{39}$ bushels per acre, for which the committee award to him the first premium, of $10.

There was but one sample of *Peas* presented, and that was from Mr. Elisha M. Bradley, of Oneida county. The crop was 41½ bushels from one acre, of the small variety, a very handsome sample of which was presented for examination. Your committee award to him the first premium, $10.

Digitized by Google

The papers of the above crops were all made out agreeable to the rules of the Society.

Mr. J. Rapelje, of Rochester, exhibited a very fine sample of "Early Kitt" Peas, for which a volume of Transactions is awarded him.

ELISHA M. BRADLEY, EAST BLOOMFIELD, ONTARIO.

Barley—53 bushels per acre.

Statement—The field upon which this crop of barley was grown, had lain in meadow a few years previous to the spring of 1849, when it was manured with forty loads of common barn-yard manure per acre, and planted to corn, of which it yielded a heavy growth.

The soil is a gravelly loam, descends gradually to the north, and is unprotected by woods or buildings. There was no manure applied to the crop of barley.

Three bushels of the two rowed variety of barley were sown per acre.

The 20th day of April, 1850, the ground was plowed with a common plow to the depth of *ten inches*, and a *subsoil plow following* in the furrow of the common plow, loosened the soil to the depth of some six or eight inches more. The seed was sown broadcast upon the land, and thoroughly harrowed in. No further culture.

July 27th. The grain "being just out of the milk," was mown, (it having been tangled so much by storms as to render it impossible to cut it with a cradle,) and put in small heaps to cure. When thoroughly dry, it was secured. Thrashed with machine the last of August; well cleaned, measured in a sealed half bushel, and found to yield one hundred and six bushels, and sold for fifty-eight cents per bushel.

Expense of cultivation,	$22 08
Interest on land, at $65 per acre,	9 10
	$31 18
Proceeds of barley,	$61 48
Four tons of straw,	16 05
	$77 48

ASAHEL R. DUTTON, MEREDITH, DELAWARE CO.

Beans, 30 bushels 20 quarts per acre.

Statement.—Previous crop, corn, with 20 loads long manure to the acre, spread on the surface. Soil, a dry loam; location, hilly; 25 loads of long manure to the acre, or rather 37 loads upon the piece of ground

Digitized by Google

selected, about 1½ acre spread upon the surface, and plowed in. Seed, the small white bean, of which one bushel was used on the piece.* Planted the first days of June, and pulled between the first and tenth of September. Planted in rows three feet apart, hills on the rows from one foot to 18 inches apart. Plow run between the rows, and hoed once in *dry weather*, as it will not do to stir the ground in hot weather. In harvesting, I pull the vines, and lay two rows together, let them lie in this situation two or three days, so that the leaves may dry; as it is frequently necessary to pull them before they are fully ripe, for fear of frosts; even a light frost injures the crop much, while the pods are in the sap. The next process is to stack them up around a stake stuck firm in the ground, with roots inside, next the stake, with stones placed at the bottom of the stake on the ground, to keep vines from the damp earth; put up in this manner, about four or six feet high; a little straw on the top to shed the rain is very beneficial, they will stand in this situation as long as you please without the least injury.

The crop stood in this situation about four weeks, and was carted to the barn, and thrashed first of December. The yield, 44¾ bushels, market value, $1.25 per bushel.

Expense of cultivation,	$20 50
Manure,	9 25
	$29 75
Value of crop,	$55 93
Straw and pods, equal to hay for fodder,	14 00
	$69 93

The method pursued in curing and harvesting this crop, I obtained from the Cultivator, many years since, and is one of the many benefits arising from Agricultural journals, which I desire to notice.

E. M. BRADLEY, EAST BLOOMFIELD.

Peas, 41½ bushels per acre.

Statement.—The field upon which this crop of peas was grown, was in the spring of 1849, manured with 40 loads of good barn-yard manure, plowed eight inches deep, and planted to corn.

The soil is a gravelly loam, lies gently undulating, is not protected by woods or buildings, and had no manure applied to it for the crop of peas. Three bushels of the Canada branch pea, were sown the 21st of April.

The ground was plowed *ten inches deep*, with a common plow, and *stirred six inches more with a sub-soil plow*; the seed was sown upon the furrow, and thoroughly harrowed in. No further culture.

Digitized by Google

The crop was ripe and cut with a scythe the 10th of August, secured the 20th, and thrashed in September, with flail, and cleaned and measured in a sealed half bushel, and found to yield 40½ bushels, worth 75 cents per bushel for seed.

Expense of cultivation,	$11 38
Rent on land,	4 53
	$15 91
Value of crop,	$31 13
Straw,	4 13
	$36 13

Digitized by Google

TREASURER'S REPORT.

DR. *Luther Tucker, Treasurer, in account with the New York State Agricultural Society.* CR.

1850.			1850.		
Jan. 17.	To balance from last account,	$2,101 30	By premiums paid, per statement A.,		$5,220 36
	Cash received at annual meeting,	108 00	Payments for trial of plows, B.,		291 12
	Cash of sundry members,	12 00	Prof. Johnston's lectures, C.,		246 21
	Cash from Comptroller,	800 00	County surveys, D.,		335 00
	Interest on investment,	560 00	Tents, E.,		900 57
	Cash borrowed,	1,000 00	Library and Museum, F.,		301 77
	Cash received at State Fair, Albany,	10,465 61	Salaries, &c., G.,		1,841 52
	Cash received for use of tent,	200 00	Miscellaneous expenses, H.,		465 72
	Cash of Thomas Bell, life membership,	50 00	Temporary loan, I.,		1,012 69
	Cash for premium erroneously paid,	20 00	State Fair, J.,		1,638 17
	Silver plate for premiums, on hand,	230 00	Printing, Binding, &c., K.,		650 71
			Silver plate for premiums, on hand,		230 00
			Cash to balance,		2,413 07
		$15,546 91			$15,546 91

We hereby certify that we have carefully examined and compared the above accounts with the accompanying vouchers, and that the same is in all respects just and true.

(Copy.)

E. P. PRENTICE, *President.*
L. G. MORRIS, *Vice-Pres't.*
B. P. JOHNSON, *Cor. Sec'y.*

Albany, January 14th, 1851.

Digitized by Google

(A.)—PREMIUMS.

Paid Wm. Rathbun, on sheep,	1	$16	00
E. S. Salisbury, on peas,	2	10	00
C. W. Eells, on potatoes,	3	10	00
R. Eells, on buckwheat,	4	10	00
Martin Springer, on potatoes	5	15	00
Nelson Van Ness, do do	6	5	00
H. B. Bartlett, do do	7	15	00
H. B. Bartlett, on wheat,	8	10	00
Benjamin Enos, on barley,	9	5	00
Peter Crispell, Jr., on corn and oats,	10	30	00
Daniel Conradt, on rye,	11	15	00
George K. Eells, on wheat,	12	15	00
Mrs. S. Breese, on needle work,	13	3	00
E. M. Bradley, on grain,	16	25	00
A. Killam, on potatoes,	17	10	00
J. S. Goold, on vegetables,	18	3	00
Wm. Baker, on buckwheat,	19	8	00
E. R. Dix, on corn and barley,	20	30	00
E. Risley & Co., on carrots,	21	14	00
Hood & Tobey, plate for premiums,	24	410	00
Joseph C. Rich, on implements,	26	8	00
Mrs. G. G. Loomis, on domestic goods,	27	2	00
Prof. J. P. Norton, on essay,	35	100	00
P. Staats, on silk,	38	5	00.
John Morse, on fruits	39	10	00
Ball, Tompkins & Flack, for gold medal,	41	12	00
John J. Thomas, on experiments,	42	5	00
H. L. Emery, on agricultural implements,	43	7	00
B. R. Norton, on fruit,	44	2	00
E. P. Beck, on cattle,	52	10	00
G. J. W. Brownson, on brooms,	53	2	00
Wm. Wright, on domestic manufactures,	58	10	00
S. Matthews, on cheese,	59	5	00
Jos. Hastings, on roots,	61	10	00
Adam Clark, on wheat,	72	10	00
A. H. Fitch, on harrow,	80	3	00
John Holbert, on butter dairy,	81, 82	80	00
Geo. Waterman, for lettering plate,	86	5	00
Hotchkiss & Smith, on carpets	87	5	00
H. Murray, on wheat,	89	3	00
Clark Avery, on domestic goods,	91	6	00
D. Ayers, on grapes	107	2	00
R. Lovett, for medals,	124	256	46
W. Edincott, for diploma,	126	15	00
Hood & Tobey, for plate for premiums,	127	8	25
Elon Sheldon, on cattle, &c.,	129	15	00
Lewis F, Allen, on poultry,	133	3	00
H. B. Bartlett, on cattle,	134	5	00
S. A. Gilbert, do	135	10	00
B. Benedict, do	136	8	00
S. A. Gilbert, do	137	5	00

Digitized by Google

Paid Edward Munson, on cattle,	138	25	00
J. H. Boyd, do	139	10	00
Augustus Ross, do	140	15	00
Elon Sheldon, do 141,	142	33	00
Hiram Sheldon, do	143	8	00
Aaron Taylor, do	144	10	00
Luke Putnam do	145	10	00
G. Lee, do	146	4	00
Richard Gypson, on sheep,	147	3	00
W. R. Sanford, on cattle, 148,	149	25	00
John L. Bennett, on horses,	150	12	00
William Miller, on sheep,	151	45	00
C. Canfield, on horses,	152	8	00
J. Van O'Linda, on horses	153	12	00
O. K. Lapham, on horses,	154	12	00
R. Hornbeck, do	155	15	00
A. H. Jaquith, do	156	10	00
J. D. Kingsland, do	157	15	00
P. Cross, jr., do	158	10	00
Jagger, Treadwell & Perry, on horses,	159	8	00
J. Van O'Linda, on horses,	160	10	00
John Butterfield, do	161	10	00
T. S. Faxton, do	162	8	00
Wm. Walker, do	163	20	00
Elihu Norton, do	164	20	00
John A. Rathbun, on sheep, 165,	166	31	00
B. J. Hayes, do	167	15	00
R. Gypson, do	168	8	00
Williams Rathbun, do	169	8	00
J. C. Rathbun, do	170	8	00
Jesse Hinds, do	171	10	00
Orrin Lathrop, do	172	8	00
N. M. Dart, do	173	15	00
L. H. Yates, do	174	10	00
R. Gypson, do	175	8	00
L. H Yates, do	176	8	00
L. G. Collins, do	177	29	00
Z. B. Wakeman, do	178	44	00
R. E. Keese, do	179	29	00
Wm. Webb, on swine,	180	8	00
Thomas Leach, on horses,	181	20	00
Nichols & Bayley, on grain cradle,	182	2	00
Brown, Babcock & Coats, on hoes,	183	2	00
W. F. Shepherd, on sugar,	184	8	00
A. Gilmore, on honey, 185,	187	6	00
Samuel Davidson, on wheat,	186	5	00
A. Marks, on fruit,	188	3	00
Joseph Sherman, on needle-work,	189	8	00
A. Sturges,	190	3	00
Jonathan Battey, on fruit,	191	10	00
H. Morrison, on grain,	192	2	00
O. Howland, do 193,	196	6	00
H. B. Bartlett, do 194,	195	11	00

Digitized by Google

Paid F. M. Rotch, on cattle,	197, 200	8	00
Chas. B. Smith, on sheep,	198	20	00
T. S. Faxton, on horses,	199	8	00
Arden Woodruff, on cattle,	201, 202	10	00
P. F. Mesick, on horses,	203	8	00
Jas. S. Wadsworth, on cattle,	204, 205	48	00
John Freemire do	206	20	00
E. V. Peck, do	207, 208, 210	38	00
W. C. Remington, do	209	5	00
E. Corning, jr., do	211, 212	65	00
D. H. Albertson, do	213	20	00
Thomas Bell, do	214	30	00
Isaac Sheldon, do	215	14	00
John Lossing, do	216	3	00
Elon Sheldon, do	217	15	00
Jas. D. Van Vechten, do	218	3	00
W. A. Keese, do &c.,	219	53	00
John Muir, sen., do	220, 221	25	00
W. L. Cowles, do and horses,	222, 223	105	00
L. Hurlbut do	224	65	00
Paoli Lathrop, do	225	15	00
R. L. Colt, do	226	100	00
George Miller, do	227	40	00
E. M. Woodford, do	228	5	00
Amos Bigelow, on horses,	229	10	00
B. B. Foss, do	230	10	00
M. DeMotte, on horses,	231	20	00
L. G. Collins, on cattle,	232	40	00
James H. Sherrill, on cattle,	233	31	00
John Bryden, do	234	5	00
S. P. Chapman, do	235	40	00
H. N. Washbon, do	236	63	00
S. A. Gilbert, do	237	2	00
H. Comstock, do	238	3	00
A. Holmes, on horses,	239	10	00
D. S. Curtis, on sheep,	240	42	00
James D. Noxon, on swine,	241	5	00
R. H. Van Rensselaer, on cattle,	242	25	00
Robert Eells, on grain and grass seed,	243	8	00
S. Abbott, on domestic goods,	244	3	00
Mary E. Silliman, on needle work,	245	1	00
F. P. Medina, on shell work,	246	3	00
Minor, Horton, & Co., on plows,	247	18	00
Eddy & Co., on horse powers, &c.,	248, 249	10	00
John P. Groshen, on seed planter,	250	3	00
Mary E. Meigs, on wax work,	251	3	00
W. Newcomb, on flowers,	252	6	00
W. Younghans, on sheep and swine,	253	44	00
Daniel Ayres, on grapes,	254	5	00
John Chadwick, on poultry,	255	10	00
W. A. Keese, on horses,	256	12	00
W. M. Bullock, do	257	20	00
S. N. Tobey, do	258	4	00

Digitized by Google

Paid David Laurent, on horses,		259	10 00
B. H. Streeter, on cattle,		260	8 00
Wm. Wilson, on domestic goods,		261	8 00
John Randerson, on plowing,		262	8 00
J. M. Sherwood, on cattle and sheep,	263,	264	78 00
W. U. Chase, on plow,		265	10 00
R. H. Chase, on horse rake,		266	2 00
Prouty & Mears, on plows,		267	48 00
Ambrose Stevens, on cattle,		268	20 00
J. B. Plum, on horses,		269	15 00
Elwanger & Barry, on fruit and flowers,	270,	271	39 00
D. C. Beard, on cheese,		272	20 00
N. French, on plows and plowing,		273	20 00
Waterbury & Jordan, on cloth,		275	10 00
J. McD. McIntyre, on cattle and sheep,	276,	277	40 50
D. Fonda, on butter,		278	5 00
R. Daniels, on corn stalk cutter,		279	5 00
J. J., & A. Davidson, on domestic goods,		280	3 00
Caroline Tice, do		281	4 00
J. H. Koonz, do		282	1 00
Sarah M. Davison, on needle work,		283	3 00
I. T. Grant, on horses and fan mill,		284	35 00
Jane Newland, on needle work,		285	3 00
Margaret Nowlan, on needle work,		286	2 00
H. P. Van Schoonhoven, on needle work,		287	3 00
E. P. Prentice, on cattle and fruit,		289	108 00
W. Strever, on oxen,		291	25 00
W. R. Mesick, on oxen,		292	5 00
J. P. Beekman, on oxen, &c.,		293	15 00
Robert Lovett, for medals,		294	167 50
Frederick Phelps, on sheep,		295	5 00
E. P. Prentice, on vegetables,		296	3 00
Emery & Co., on agricultural implements,		298	64 00
Norman Briggs, on flowers,		300	3 00
Wm. Robgan, on ducks and geese,		301	6 00
Wm. Newcomb,		302	12 00
Mrs. J. T. Van Namee, on floral ornament,		303	4 00
do do domestic goods,		304	24 00
E. M. Van Alstyne, on poultry,		305	3 00
John C. Collins, on sheep,		306	5 00
Elisha Dorr, on fruits and vegetables,		307	11 00
Isaac Ayer, on domestic goods,		308	2 00
John B. Borst, on horse,		309	5 00
W. Walch, on poultry,		310	3 00
Z. M. Saunders, on vegetables,		311	3 00
David Ray, on horse rake,		312	2 00
John Dingwall, on flowers and vegetables,		313	8 00
Mrs. B. R. Voorhees, on domestic goods,		314	8 00
Anna N. Garfield, on needlework,		315	3 00
J. Hutchinson, on silk,		316	8 00
Mrs. D. E. P. Rose, on domestic goods,		317	10 00
Le Roy Mowry, on cattle,		318	25 00
E. E. Platt, on poultry,		319	12 00

Digitized by Google

Paid David Conradt, on honey and grain,.....	320, 321	5 00
Wm. P. Conradt, on hay rigging,.....	322	2 00
R. H. Drake, on fruit,.....	323	3 00
Andrew Passenger, on vegetables, ...	324	3 00
Mrs. R. Taylor, on fancy work,.....	327	2 00
L. Salisbury, on swine, ...	328	5 00
M. D. Wands, on poultry,.....	329	3 00
Wm. Hurst, on swine,.....	330, 331	18 00
C. V. S. Truax, on horse,.....	332	5 00
M. Tillman, on flowers,.....	333	9 00
Wilson, Thorburn & Teller, on fruit,.....	334	2 00
Jas. Wilson, on flowers and plants,.....	335	33 00
Mrs. B. B. Kirtland, on needle work,.....	336	3 00
Bosworth, Rich & Co., on plow, ...	337	8 00
B. B. Kirtland, on poultry,.....	338	3 00
L. M. Lown, on farm wagon, ...	339	5 00
Emmeline W. Starin, on needlework,.....	340	3 00
Miss Mary E. Server, on "	341	3 00
E. Corning, Jr., on horse,.....	342	20 00
Abby C. Salisbury, on needlework,.....	343	3 00
Edgar Scasce, on sheep,.....	344	5 00
Joseph Haswell, on cattle and sheep,.....	345, 346	53 00
Ransom and Baker, on sheep,.....	347	35 00
Mrs. B. Page, on domestic goods,.....	348	3 00
Mrs. A. Brown, do	350	1 00
Mrs. R. A. Brown, do	351	3 00
Miss E. Carter, on needlework,.....	352	3 00
H. Wyman, do	353	3 00
Geo. Vail, on cattle, ...	354	76 00
A. P. Case, on needlework, ...	355	3 00
M. O'Brien, on cart, ...	356	3 00
Hildreth & Bro., on cheese, ...	357	15 00
Fox & Colton, do	358	5 00
C. B. Hoord, on steam engine,.....	359	25 00
Jas. Wilson, on painting,.....	360	5 00
E. H. Pease & Co., for books for premiums,.....	361	69 50
Geo. Waterman, for lettering medals,.....	362	64 00
C. M. Hovey & Co., for books for premiums,.....	364	24 00
C. F. Crossman, on vegetables,.....	376, 377	13 00
E. R. Dix, on sheep, &c.,.....	378, 379, 380	15 00
Nathan Morgan, on horse,.....	381	6 00
Jas. M. Sill, on vegetables,.....	382	2 00
P. Bennett, on domestic goods,.....	383	3 00
Maria T. Bennett, on needlework,.....	384	2 00
Jonas Lasher, on butter, ...	385	5 00
Joseph Cary, do	386	15 00
Mrs. H. Weir, on domestic goods,.....	387	29 00
Henrietta O. Lansing, do	388	3 00
Mrs. Wm. Heuston, do	389	2 00
Mrs. O. Northrop, do	390	2 00
Mary and Ellen E. Hasken, needle work,.....	391	3 00
Sarah H. Thayer, wax flowers,.....	392	3 00
M. Knickerbacker, on cattle,.....	393	6 00

Digitized by Google

Paid Hood & Tobey, for silver plate,	394	11 00
Isaac Dolittle, on stave machine,	395	3 00
Cyrus Nichols, on domestic goods,	396	4 00
Geo. Campbell, on sheep,	397	15 00
Marietta Clark, on domestic goods,	398	2 00
Luman Shepherd, on do do 399,	400	14 00
R. L. Colt, on Poultry,	401	12 00
Gray & Sprague, for books for premiums,	402	20 00
Mrs. Ann H, Williams, on needle work,	405	3 00
Henry Vail, on fruits and vegetables,	406	22 00
Isaac Burr, on maple sugar,	407	10 00
Esther Fuller, on straw bonnet,	408	3 00
Samuel McGraw, on maple sugar,	409	15 00
J. M. Lovett, on poultry,	410	3 00
S. H. Church, on sheep,	411	40 00
J. H. B. Church, on oven,	412	5 00
Mary E. Frink, on domestic goods,	415	2 00
Hiram Sheldon, on cattle,	416	3 00
Robert Lovett, for medals,	418	124 15
M. M. Smith, on flannel,	420	6 00
S. Burchard, on cheese,	421	10 00
J. H. Willard, on vegetables,	422	15 00
L. S. Bundy, on cattle,	423	3 00
Samuel Morgan, on swine,	427	3 00
Isaac Denniston, on fruit,	428	10 00
D. T. Vail, on flowers,	430	5 00
T. K. Van Zandt, on painting,	431	5 00
J. S. Wadsworth, on cattle,	433	12 00
Mrs. N. A. Cook, on needle work,	434	3 00
J. Conger, on carpeting,	435	8 00
John Campbell, on sheep, &c.	436	15 00
Luther Comstock, on cattle,	437	2 00
F. B. Leonard, do	438	10 00
Wm. C. Durant, on horses,	440	10 00
Mary E. Train, on domestic goods,	442	6 00
C. Menand, on flowers,	443	7 00
Jacob Henry, on seed corn,	445	3 00
Magdalene Cutler, on needle work,	446	2 00
Elizabeth Sexton, do	447	3 00
Herman Wendell, on fruit,	449	2 00
H. Rogers on cheese press,	459	2 00
Selah G. Smith, on plowing,	460	10 00
L. E. Smith, on horse, &c., 462,	463	11 00
Draper, Brown & Chadsey, on scythe snathes,	465	2 00
Philip Lasher, on butter,	474	10 00
R. C. Derrick, on sheep and swine, 475,	476	18 00
		$5,220 36

Digitized by Google

(B.)—Trial of Plows.

Vouchers, 92, 93, 94, 95, 96, 97, 98, 99,		$252 64
do 108, 122, 365, 456,		38 48
		$291 12

(C.)—Prof. Johnston's Lectures.

Prof. Johnston's expenses,	84	59 71
W. Wall, services at capitol,	37	6 50
Sherman Croswell, reporting Lectures,	51	180 00
		$246 21

(D.)—County Surveys.

Dr. Asa Fitch, survey of Washington co.,	88, 132	125 00
Dr. J. H. Salisbury, for analysis for survey,	25, 50, 77, 111	210 00
		$335 00

(E.)—Tents.

E. C. Williams, repairs of old tent,	14	15 12
do for new tent,	54, 55.	750 00
L. B. Langworthy, Ins. on tent,	78	9 00
E. C. Williams, transportation, putting up, and care of tent at State Fair,	274	126 45
		$900 57

(F.)—Library and Museum.

D. L. Van Antwerp, binding,	15, 68	22 68
C. S. Francis & Co., books,	67	4 37
B. P. Johnson, Museum, 63, 103, 118, 452, 453,		58 05
F. Hautsch,	64	3 00
A Boardman,	65	14 98
P. L Gilbert, books,	76	10 00
B. P. Johnson, library,	84, 102, 120, 366	11 00
Little & Co., Books,	112	10 50
Hood & Tobey, barometer and clock,	363	26 50
R. H. Pease,	404	11 50
Mary M. Chase, grass bouquet for museum,	429	10 00
T. K. Van Zandt, for painting for museum,	432	5 00
Gas Company, for gas pipes, &c.,	458	30 00
Van Heusen & Charles, for gas fixtures,	457	50 43
E. H. Pease & Co., for books,	471	33 76
		$301 77

Digitized by Google

(G.)—SALARIES, &c.

B. P. Johnson, salary, 36, 56, 70, 71, 79, 90, 106, 109, 116, 125, 123, 297, 413, 441, 461, 464,		1,500 00
do do of assistant,	23, 110,	200 00
do traveling expenses, 74, 108, 113, 117, 367, 424,		133 14
do do	101,	8 38
		$1,841 52

(H.)—MISCELLANEOUS.

Paid H. W. Rogers, balance of Buffalo debt,	22	18 51
G. D. Fonda, services at meetings,	28	2 50
W. Wall, do do	30	4 50
Jas. Whitely, do do	31	4 50
Thos. Lee, use of crockery,	32	46
D. E. Gavit, for portraits of presidents,	48	48 00
do for portrait of Prof. Johnston,	49	12 00
S. Howard, reporting discussions,	57, 69,	25 00
B. P. Johnson, insurance,	426	11 25
Postages, 46, 66, 75, 85, 104, 114, 119, 326, 368, 414	455	147 69
B. P. Johnson, incidental expenses, 47, 62, 73, 83, 100 115, 121, 325, 369, 425,	454	102 24
do do	466	6 79
do Postage,	467	15 60
Warren & Steele, incidental,	468	4 08
Wm. A. Wharton, glass ware for floral tent,	470	22 68
E. H. Pease & Co., stationery,	473	40 57
		$465 72

(I.)—TEMPORARY LOANS.

Paid discounted notes,	288, 290	1,012 69

(J.)—STATE FAIR EXPENSES.

Paid Gray & Wilson, for lettering signs,	130	24 38
R. H. King & Co., for muslin for signs,	131	6 20
Lewis R. Gregory, for painting,	371	1 00
Francis S. Low, for use of steam power,	347	75 00
John Gibson, for shavings,	372	2 00
Wm. Van O'Linda, for services,	373	2 50
Thomas Wilson, horse hire,	374	10 00
S. V. Winne, for saw dust,	375	12 00
Moore & Ireland, extra expenses at State Fair,	417, 450	1,035 00
Lewis R. Gregory,	419	4 00
John F. Strain, refreshments at State Fair,	439	41 44
Geo. Harris & Son, carriage hire,	448, 451	78 00
John A. Clark, expenses at State Fair,	469	2 00
E. H. Pease & Co., Class books,	472	19 65
Jeremiah Nowlan, wood for steam engine,	370	25 00
		$1,638 17

Digitized by Google

(K.)—PRINTING, BINDING AND ADVERTISING.

Paid H. H. Van Dyck, for advertising,.....	29, 60, 128	7 00
Stone & Henly, do	33	1 50
Jas. Van Orden, printing Rep. of Ag. Commissioners,	40	25 00
Joel Munsell, printing notices, ...	45, 299	11 75
Croswells & Shaw, advertising, &c., ...	105	15 38
R. H. Pease, for tickets, ...	403	11 00
Chas. Van Benthuysen, printing and binding, ...	444	579 08
		$650 71

FRUITS.

Dr. Herman Wendell, from the committee which consisted of the Hon. T. G. Yeomans, the Hon. Samuel Miller and himself, reported that several varieties of seedling apples from different parts of the State had been offered for examination and premium, neither of which were considered worthy of name or notice. He also, begged leave to add that the select lots of fruits, adapted to the different varieties of soil and climate of the State, heretofore recommended, and fully described in previous volumes of the Transactions contained in them, all that the committee, at present, consider worthy of such distinction, and as the present volume might, in all probability, come into the possession of many who could not conveniently refer to these volumes; for the information of such persons, it was deemed advisable to append a list of those varieties to this report, and for a full description, as well as other particulars concerning them, refer them to former volumes, and also to the different standard works on this subject. The lists are as follows:

APPLES—*Summer*—Summer Rose, American Summer Pearmain, Yellow Harvest, Early Strawberry, Early Joe, William's Favorite, and Large Yellow Bough.

Autumn—Autumn Strawberry, Pomme Royale, Fall Pippin, Golden Sweet, Gravenstein, Jersey Sweeting, Porter, Rambo, Detroit Red, and Belle et Bonne.

Winter—Norton's Melon, Mother, Northern Spy, Wagener, Wine Apple, Dominie, Peck's Pleasant, Baldwin, Newtown Pippin, Swaar, Esopus Spitzenburg, Rhode Island Greening, Lady Apple, Hubbardston's Nonsuch, Tallman's Sweeting, Jonathan, Danver's Winter Sweet, Vandevere, Ladies' Sweeting, Westfield Seek-no-further, American Golden Russet, Roxbury Russet, and Yellow Belle-fleur.

PEARS—*Summer*—Rostiezer, Tyson, Madeleine, or Citron des Carmes, Dearborn's Seedling, Bloodgood, Doyenne D'Ete.

Digitized by Google

Autumn—Bartlett, or Williams Bonchretien, Fondante D'Automne, Seckle, White Doyenne, Swan's Orange, Louise Bonne de Jersey, Steven's Genesee, Beurré Bosc, Washington, Grey Doyenné, Golden Beurré of Bilboa, Andrews, Urbaniste, Flemish Beauty.

Winter—Beurre D'Aremberg, Glout Morceau, Winter Nelis, Vicar of Winkfield.

PLUMS—Reine Claude, Purple Favorite, Washington, Red Gage, Jefferson, Schenectady Catharine, Bleecker's Gage, Lawrence's Favorite, Columbia, Prince's Imperial Gage, Coe's Golden Drop, Denniston's Red, Madison, Prune D'Agen, Albany Beauty, Peach Plum, Huling's Superb.

PEACHES—Early Tillotson, Grosse Mignonne, Royal George, George the 4th, Cooledge's Favorite, Red Rareripe, Malta, Crawford's Early Melocoton, Breevoort, Morris White Rareripe, White imperial, Old Mixon Freestone, Bergen's Yellow, Crawford's late Melocoton.

CHERRIES—May Duke, Knight's Early Black, Black Eagle, Graffion, or Bigarreau, Black Tartarian, Elton, Florence, Belle de Choisy, and Downer's Late.

APRICOTS—Moorpark, Breda.

NECTARINES—Downton and Boston, or Perkin's Seedling.

GRAPES—Isabella and Catawba.

STRAWBERRIES—Hovey's Seedling, Burr's New Pine, Large Early Scarlet, Swainstone's Seedling.

RASPBERRIES—Fastolff, Red Antwerp-True-Franconia, Yellow Antwerp.

CURRANTS—White Dutch, Red Dutch, Knight's Sweet Red, White Grape, May's Victoria.

GOOSEBERRIES—Compton's Sheba Queen, Green Walnut, Crown Bob, Woodward's Whitesmith.

It was the intention of the committee to give some general directions as to the best manner of setting out fruit trees; but, as all the standard works on fruits, and nearly every fruit catalogue of reliable nurserymen, contain minute instructions on that subject, it is deemed superfluous, but they cannot leave the subject without enjoining on planters the absolute necessity of careful and constant culture, after planting out, as well as to remind them of the great advantages gained by mulching the first season, with long litter, saw dust, or spent tan.

The committee report, that there were exhibited by Mr. W. H. Rogers, Williamson, Wayne county, the following varieties of apples, viz: Roxbury Russet, Baldwin, Sugar Loaf Greening, Green Newtown Pippin, Yellow Newtown Pippin, Swaar, Esopus Spitzenburgh, Yellow Pippin, Golden Rus-

Digitized by Google

set, Stoddard, Holland Pippin, Yellow Russet, Vandevere, Jersey Redstreak, Watermelon Sweet, Artichoke, Seek-no-further, Wine, Minister, Bell-flower, Burlington Spitzenburgh, Rhode Island Greening, Gilliflower, Flushing Spitzenburgh, Palister, Pumpkin Sweet, Williamson Sweet, Tallman Sweet, Hartford Sweet, Genesee Greening, Sweet and Sour, and two varieties for a name.

By N. Hayward, Brighton, Monroe county—Hubbardston Nonesuch, Sweet Pearmain, Golden Russet, English Russet, Roxbury Russet, Pomme Grise, Rhode Island Greening, Everlasting Red, Green Sweeting, Newtown Pippin, Kirke's Lord Nelson, Seek-no-further, Sweet Swaar, Swaar, 20 oz. apple, Wilson Apple, Gloria Mundi, Northern Spy, Baldwin, Black Gilliflower, Red Cheek Pippin, Holland Pippin, Pinnock's Red Winter, Seedling White Bell-flower, Esopus Spitzenburgh, Ribstone Pippin.

By P. Patterson, Moscow, Livingston county—Peck's Pleasant, Northern Spy, Federal Apple, Rhode Island Greening, Roxbury Russet, Esopus Spitzenburgh, Cornish Gilliflower, Pecker, Golden Russet, Twenty Ounce, Seek-no-further, Black Apple, Sweet and Sour, Pippin, Holland Pippin, Boston Black, Vandevere, Swaar, Patterson Sweet, Groveland Sweet, Green Sweet, Tallman Sweeting, and Newtown Pippin.

By J. W. Bailey, Plattsburgh—Hubbardston Nonesuch, Esopus Spitzenburgh, Spitzenburgh, Roxbury Russet, Swaar, Harvey, Rhode Island Greening, Seedlings, Pound Sweetings, Pomme Grise, Westfield Seek-no-further, Bourassa, Reignette de Cote, Holland Sweet, Fall Pippin, Eastern Rosseau.

By Luther Harger, Plattsburgh—Apples, for name.

By E. M. Bradley, East Bloomfield—Northern Spy, Cyprus Apple, Seedling.

By R. G. Pardee, Palmyra—Eleven varieties.

By Wm. Newcomb, Pittstown—Nine varieties.

By E. P. Prentice, Albany—Swaar, English Russet, Tallman Sweeting, Vandevere, Porter, Gilliflower, Rhode Island Greening, Kilham Hill, Gloria Mundi, Rambo, Baldwin, Flushing Spitzenburgh, Newtown Pippin, Romain, Scarlet Nonpareil, Sheep Nose, Gravenstein, Hubbardston Nonesuch, Pennock's Red Winter, Northern Spy, Imperial Russet, American Pippin.

By Charles Lee, Penn Yan—Wagener Apples.

By T. G. Yeomans, Walworth—Apples.

By David Emery, Ithaca—King Apples.

By J. H. Watts, Rochester—Red Astrachan Apple, Seek-no-further, Wagener, Fameuse, Early Joe (showing high culture), Early Joe (showing poor culture), Northern Spy.

Digitized by Google

By John Donnellan, Greece—Pomme Grise, Baldwin, Rhode Island Greening, Fameuse, Black Gilliflower, Ribstone Pippin, English Russet.

By J. Johnson, Brighton—Baldwin, Tallman Sweeting, Esopus Spitzenburgh, Red Cheek Pippin.

F. W. Lay, Greece—Blue Pearmain, Baldwin, Red Pearmain, Newtown Pippin, Sweet Swaar, Green Sweeting, Westfield Seek-no-further, Pumpkin Sweet, Holland Pippin, Esopus Spitzenburgh, Roxbury Russet, Rhode Island Greening, Red Canada, Pomme Grise, English Russet, Tallman Sweeting, Twenty Ounce Pippin, Ox Apple, Yellow Belle-fleur, Romanite, Williamson, York Pippin, Scarlet Pearmain, one Seedling Apple, and one Bunch of Isabella Grapes.

By H. Hooker, Rochester—Yellow Belle-fleur, Golden Russet, Baldwin, Esopus Spitzenburgh, Rhode Island Greening, Swaar, Tallman Sweeting, Hooker Apple.

By H. Dale Adams, Brighton—Newtown Pippin, Red Cheek, Baldwin, Swaar, Northern Spy, Esopus Spitzenburgh, Cooper's Market.

By E. Darrow, Greece—Esopus Spitzenburgh, Yellow Belle-fleur, Vandevere, Rhode Island Greening, Warren, Baldwin, York Pippin, Newtown Pippin, Holland Pippin, Tallman Sweeting, Jonathan, Twenty Ounce.

By R. H. Brown, Greece—Red Canada, Wine Apple, Ribstone Pippin, York Pippin, Pound Sweeting, Esopus Spitzenburgh, Twenty Ounce, Sweet and Sour, Romanite, Black Detroit. Green Sweeting, Golden Russet, Newtown Pippin, Late Sweeting, Seek-no-further, Tallman Sweeting, Swaar, Black Gilliflower, Roxbury Russet, Cornish Gilliflower, Fameuse, Rhode Island Greening.

By C. J. Ryan & Co., Rochester—Swaar, Esopus Spitzenburgh, Newtown Pippin, Romanite Pippin, Holland Pippin, Roxbury Russet, Baldwin, Vandevere, Northern Spy, Wagener, Rhode Island Greening, Golden Russet.

By Dennis Clarke, Palmyra—Five varieties

By Joel Hall, Marion—Six varieties.

By Eli Barnum, Walworth—Six varieties.

By D. Tomlinson, Schenectady—Baldwin, Vandevere, Greenings.

By H. B. Bartlett, Paris, Oneida county—Rhode Island Greening, Roxbury Russet, Spitzenburgh, Seek-no-further, Baldwin

By Henry Vail, Troy—Baldwin Apple.

By Wilson, Thorburn & Teller, Albany—Baldwin, Swaar, Rhode Island Greening, Spitzenburgh, Sweet Pippin, Bell-flower.

By David Coonradt, Brunswick—Rhode Island Greening, Gilliflower, Clover, Tallman Sweet.

Digitized by Google

By W. P. Coonradt, Brunswick—Swaar, French Pearmain, Esopus Spitzenburgh, Winter Pippin.

And collections of choice apples, by E. G. Stearns, Gorham, Ontario county; Stephen Hyde, Palmyra; Henry Powis, Seneca Falls; Myron J. Pardee, Palmyra, twelve varieties; L. A. Ward, Rochester, Red Canada Apple.

By E. C. Frost, Catharine, Chemung county—Wagener, Winter King, Williamson, Green Newtown Pippin. Other names not given.

By John J. Mosher, Plattsburgh—Newtown Pippin, Sweet Spitzenburgh.

By Ephraim Hoag, Plattsburgh—Black Apple, Strawberry.

By Charles J. Hascall, Plattsburgh—Two varieties Russet.

PEARS—By Henry Vail, Troy—Easterburre, Columbia, Inconnu van Mons, Cresane.

By R. G. Pardee, Palmyra—three varieties.

By H Hooker, Rochester—St. Germain, Pears.

GRAPES—Joseph Cary, Albany—Isabella and Catawba.

By R. G. Pardee, Palmyra—Catawba and Isabella.

By Townend Glover, Fishkill Landing—A collection of models of fruit in composition, consisting of thirty-seven varieties of plums, twenty-two varieties of cherries, sixteen varieties of apples, eighteen varieties of pears, four varieties of quinces, twelve varieties of strawberries, seven varieties nectarines, and several varieties of both native and foreign nuts. These models are intended by Mr. Glover, for the instruction of members, and convenience of committees of Horticultural, Agricultural and Pomological Societies, and as they are copied from the fruits in their different stages of ripening, and are both truthfully and beautifully executed, and admirably adapted to the purposes intended.

Foreign Fruit.

By F. R. Elliot, Cleveland, Ohio, Belmont, or Gate Apple.

By S. G. Goodrich, Burlington, Vt., eight varieties, Baldwin, Hubbardston Nonsuch, Bourassa, Pomme Gris, Golden Pippin, Westfield Seek-no-further, Green Newtown Pippins, Yellow do.

Wines.

By Miss Sophia Goodrich, Burlington, Vt., Red Wine, (red currant,) Purple, (black currant,) White do, (white currant,) Forest do, (elderberry,) Gooseberry Wine, Elderberry do.

By James Stoddard, Esq., Palmyra—wine from a seedling grape.

By George Vail, Esq., Troy, wine from Isabella grape.

Digitized by Google

By J. H. Watts, Rochester—A beautiful display of colored prints of apples and pears, painted at the German Ebenezer Society, near Buffalo.

Premiums.

For the best collection of apples and pears—W. H. Rogers, Williamson, Wayne county; Small silver medal and Diploma.

2d. N. Hayward, Brighton, Monroe county; Diploma and Downing's Fruits.

3d. F. W. Lay. Greece, Monroe co.; Downings Fruits.

4th. Peter Paterson, Moscow, Livingston co.; Vol. Transactions.

5th. J. W. Bailey, Plattsburgh, Clinton co.; American Fruit Culturist.

A volume of Downing's Fruits to Luther Harger, Plattsburgh; E. M. Bradley, East Bloomfield; M. J. Pardee, Palmyra; Wm. Newcomb, Pittstown; E. P. Prentice, Albany; Charles Lee, Penn Yan; T. G. Yoemans, Walworth; E. C. Frost, Chemung; R. Handy, Ogden.

Thomas' American Fruit Culturist to David Emery, Ithaca; G. H. Watts, Rochester; John Donnellan, Greece; J. Johnson, Brighton; H. Hooker, Rochester; H. Dale Adams, Brighton, E. Darrow, Greece; R. H. Brown, Greece; C. J, Ryan, Rochester.

Norton's Prize Essay to Dennis Clark, Palmyra; Joel Hall, Marion; Eli Barnum, Walworth; D. Tomlinson, Schenectady; H. B. Bartlett, Paris; Henry Vail, Troy; Wilson, Thorburn & Teller, Albany; David Coonradt, Brunswick; W. P. Coonradt, Brunswick; E. G. Stearns, Gorham; Stephen Hyde, Palmyra; Henry Powis, Seneca Falls, L. A. Ward, Rochester; J. J. Mosher, Ephraim Hoag, Chas. J. Hascall, Plattsburgh.

Pears.

1. Henry Vail, Troy; Downing's Fruits
2. R. G. Pardee, Palmyra; American Fruit Culturist

Grapes.

1. Joseph Cary, Albany; Downing's Fruits.
2. R. G. Pardee, Palmyra; American Fruit Culturist.

Models of Fruit.

Townend Glover, of Fishkill Landing, Small Silver medal and Diploma.

Foreign Fruit.

F. R. Elliott, Cleveland, Ohio,—Apples; Vol. Transactions.

S. E. Goodrich, Burlington, Vt.; Vol. Transactions.

Wines.

Miss Sophia Goodrich, Burlington, Vt., six varieties of wine; Small silver medal and Norton's Prize Essay.

James Stoddard, Palmyra; Downing's Fruits.

George Vail, Troy; American Fruit Culturist.

Digitized by Google

MANAGEMENT OF FARMS.

Committee—Hon. A. Van Bergen, Greene; Hamilton Murray, Esq., Oswego; Hon. Samuel Cheever, Saratoga.

The committee awarded the premiums as follows:

First premium, Silver Cup, value $50, to Rawson Harmon, Wheatland, Monroe county.

Second—Silver Cup, value $30, to D. D. T. More, Watervliet, Albany county.

Third—Silver Cup, value $20, to Elisha M. Bradley, East Bloomfield, Ontario county.

To David Coonradt, Brunswick, Rensselaer county; 4 Vols. Transactions.

Two designs for farm houses, were submitted to the examination of the committee, but they did not in their opinion possess such excellence as would justify them in awarding a premium.

The following are the questions required to be answered by the competitors for premiums:

Soils, &c.

1. Of how much land does your farm consist? and how much wood, waste and improved land respectively?
2. What is the nature of your soil and subsoil? Is there limestone in it? What rocks are found in it?
3. What do you consider the best mode of improving the different kinds of soil on your farm? Of clay soil, if you have it—of sandy soil, and of gravelly soil? Answer separately.
4. What depth do you plow? What effect has deep plowing had on various soils?
5. Have you made any experiments to test the difference in a succeeding crop, between shallow, common or deep plowing?
6. Have you used the subsoil plow? and what have been its effects on different soils and crops? Have you drained any of your lands? If so, what soils, and with what results?
7. What trees and plants were indigenous to your soil? Give the names of each.

Manures.

8. How many loads of manure (30 bushels per load) do you usually apply per acre? How do you manage your manure? Is it kept under cover? or are there cellars under your barns or stables for receiving it?
9. What are your means and what your manner of making and collecting manure? How many loads of manure do you manufacture annually? How many do you apply?
10. How is your manure applied; whether in its long or green state or in compost? For what crops, or under what circumstances, do you prefer using it, either in a fresh or in a rotten state.
11. Could you not cheaply, essentially increase your supply o manure by a little extra labor?

Digitized by Google

12. Have you used lime, plaster, guano, salt, or any substance not in common use as manure? In what manner were they used, and with what results?

TILLAGE CROPS

13. How many acres of land do you till? and with what crops are they occupied, and how much of each crop?

14. What is the amount of seed planted or sown for each crop—the time of sowing—the mode of cultivating and of harvesting—and the product per acre? Have any insects been found injurious to your crops? If so, describe them and the remedies adopted. Have you made or can you give an estimate of the value of fertilizing matter taken from the soil by an acre of wheat estimating 20 bushels per acre?

15. What kind and quantity of manure do you prefer for each, and at what times and in what manner do you apply it?

16. How deep do you have manure covered in the earth, for different crops and different soils?

17. Have your potatoes been affected with any peculiar defect or disease, and have you been able to discover any clearly proved cause for it, or found any remedy?

GRASS LANDS, &c.

18. What kind of grasses do you use? How much seed of clover, or the various kinds of grass do you sow to the acre? At what season of the year do you sow,—and what is the manner of seeding? What kinds of grass are best adapted to lands used for dairy purposes?

19. How many acres do you mow for hay, and what is the average product? At what stage do you cut grass, and what is your mode of making hay?

20. Is any of your mowing land unsuitable for the plow, and what is your mode of managing such land?

21. Have you practiced irrigating or watering meadows or other lands, and with what effect? What is your particular mode of irrigation and how is it performed?

22. Have you reclaimed any low, bog or peat lands? What was the mode pursued, the crops raised, and what the success?

23. Have you succeeded in eradicating the weeds from your farm, if so, by what methods, and what weeds are most troublesome.

DOMESTIC ANIMALS.

24. How many oxen, cows, young cattle and horses do you keep, and of what breeds are they?

25. Have you made any experiments to show the relative value of different breeds of cattle or other animals for particular purposes, and with what results?

26. What do you consider the best and cheapest manner of wintering your cattle; as to feed, watering and shelter?

27. How much butter and cheese do you make annually, from what number of cows, and what is your mode of manufacture?

28. How many sheep do you keep? Of what breed or breeds are they? How much do they yield per fleece, and what price does the wool bring? How many of your sheep usually produce lambs, and what number of lambs are annually reared? How much will your sheep or lambs sell per head to the butcher?

Digitized by Google

29. What do you consider the best and cheapest manner of wintering your sheep as to food, watering and shelter? How many in proportion to your flock (if any) do you lose during the winter? What difference, if any, between the fine and coarse wooled sheep in these respects?

30th. How many swine do you keep, of what breed are they, how do you feed them, at what age do you kill them, and what do they weigh when dressed?

31. What experiments have you made to show the relative value of potatoes, turnips and other root crops, compared with Indian corn, or other grain, for feeding animals. either for fattening or for milk.

Fruit.

32. What is the number of your apple trees? Are they of natural or grafted fruit? and chiefly of what varieties?

33. What number and kind of fruit trees, exclusive of apples, have you? and what are among the best of each kind?

34. What insects have attacked your trees, and what method do you use to prevent their attacks?

35. What is your general management of fruit trees?

36. What other experiments or farm operations have produced interesting or valuable results?

Fences, Buildings, &c.

37. What is the number, size and general mode of construction of your farm buildings and their uses?

38. What kind of fences do you construct? What is the amount and length of each kind? And their cost and condition? Have you constructed any wire fence? If so, what has been its cost, and what its advantages, and how made?

49. To what extent are your various farming operations guided by accurate weighing and measuring? And to what degree of minuteness are they registered by daily accounts?

40. Do you keep regular farm accounts? Can you state the annual expense in improving your farm, and the income from it, with such precision that you can at the end of the year, strike an accurate balance of the debt and credit? Would not this practice conduce very much to close observa tion, careful farming, and in the end much improve your system, as well as better your fortune?

41. Give the annual receipts and expenditures on your farm specifying each.

DESCRIPTION OF BLUE POND FARM AND ITS CULTIVATION.

Rawson Harmon, Wheatland, Monroe county.

Soil.

1. The farm I have occupied thirty years; is situated near the center of the town of Wheatland, in Monroe county.

One hundred and fifty-nine acres of it is what was formerly called scrub oak openings. In its wild state, most of it was covered with white, black, and yellow oak brush, with a few scattering trees of the same varieties.

Digitized by Google

Seventy acres are swamp and timbered land, with a pond of thirteen acres, and seven acres taken up with roads and lanes—making two hundred and forty-nine acres in all.

2. The dry land is sandy, gravelly loam, with a very little clay. On the most of it there are some stones—small cobbles, small boulders, and some limestone. The subsoil, to the depth of fifteen feet, is gravel, then clay hard pan.

The swamp land is covered with muck, or decomposed vegetable matter, varying from three feet to six inches in depth. Subsoil, marl, which contains eighty-five per cent. of lime.

3. By sowing plaster on all the land where wheat, barley, and oats are sown, at the rate of one bushel per acre, and making use of all of the manure made on the farm and hog pen, my farm is best improved.

The hoed crops are manured with twenty-five to thirty loads per acre of long and unfermented manure. What is not used there is composted for the wheat crop, and is applied after the last plowing, being well worked in with the cultivator before the wheat is sown. The crops have improved one-third under this mode of treatment.

4. The usual depth of plowing is from six to nine inches; for wheat, nine inches is better than less; for corn, as deep as the plow can cover the manure well. None should be left exposed to the sun. The largest plows are the best for this purpose.

5. Deep plowing has uniformly produced the best crops, on the hard oak lands; wheat roots have been known to run to the depth of four feet in loose soils in this vicinity.

6. The subsoil plow has not been introduced here, as the soil is so porous as not to require it.

MANURES.

7. Most of the sheep manure is made under cover; the horse and cattle dung is mixed with the straw in the yard each day. I have no cellars for manure; it is worth more to mix with the straw.

8. The only means of making manures are the resources of the farm. All of the stock are housed, through the night and part of the day. They are well supplied with straw for litter. The sheep folds are not cleared out from fall until spring, which fills them with the most valuable manure.

9. There is made annually about 350 loads of manure. All is used the same year. What is made at the horse stable through the summer is applied to the land prepared for wheat.

10. About one-third of the manure is applied to the hoed crops, and the remainder is composted for the wheat crops.

Digitized by Google

11. The muck and marl from my swamp land would be valuable for some sections, but lime has no effect on my land, and the muck is worth more where it is than it would be in the compost heap. I have applied marl to different fields and crops without any visible effect.

12. I have applied forty bushels of unslaked lime to the acre, and with wheat, corn, and clover, it made no improvement. Ashes, plaster, and salt, equal parts, applied to corn as planted, is the best top dressing that I have made use of.

TILLAGE.

13. Harvested 49 acres of winter wheat of the improved Flint and Soule's varieties; eight acres of corn, twelve and eight rowed yellow; five acres of barley, and one acre of potatoes.

14. The amount of seed sown to the acre varies according to the variety. One bushel of improved flint will seed as well as one and a half bushels of Soule's. For several years I have soaked seed wheat in brine, and dried with fresh slaked lime. I have not fully disposed of all smut by this process. Not willing to give it up, I dissolved one pound of blue vitriol in boiling water; then sprinkled it over five bushels of wheat spread on the floor, stirring it till all became saturated with the solution, then sowing.

From thirty acres thus sown, not a smut head was produced. Smut is produced by a bug, which I call the smut bug. The bugs deposit their eggs on the fuzz end of the berry, and they are carried to the soil in the wheat. It remains there till spring hatches it, when it seeks subsistence on the wheat root, until the berry is formed. Then it ascends the stalk and deposits its eggs on the smut balls and berries of wheat. While preying on the root, its poisonous quality changes the sap of the stalk, and produces smut. It does not confine itself to the smut ball and wheat berry. Sometimes the eggs are deposited on the straw, but the smut ball is its favorite place of deposit. Almost every head and kernel, from the stool where the bug is matured, is changed to smut.

My wheat is mostly sown with Palmer's wheat drill. Improved flint, one bushel per acre, and of Soule's one and a half bushels. Sown from the 8th to the 15th of September. It was mostly cut with "MacCormick's reaper." Seven men, a boy, and one pair of horses, will cut and put up about twelve acres per day, at a cost of fifty-eight cents per acre. It is thrashed with one of Pitt's thrashers and separators. The wheat leaves the machine fit for the market. The past season we thrashed over four hundred bushels per day. The chaff is all saved, and the straw well stacked, which is worth, for feeding to sheep and cows, as much as the cost of drawing in and thrashing the wheat. The most of my wheat is sowed on clover lay

Digitized by Google

plowed once in June and July, from eight to nine inches deep, cultivated and harrowed three times, and then drilled in. My corn is grown on clover lay with one plowing, then rolled and harrowed well; then marked with a marker, with a horse and man, four rows marked at a time, three feet two inches apart each way. Between the 10th and 15th of May I planted six quarts of the twelve rowed yellow per acre, with one quart of pumpkin seeds. As soon as the rows were to be seen I passed through it with the shovel plow. After ten days I went over it again, the other way, and then followed with hoes, to destroy the weeds and straighten up the corn.

On clover lay, with the manure well turned under, but few weeds appeared. After ten days I went through it again. The first week in September, commenced cutting up, leaving four, and cutting four, which were laid in the standing corn. I then went through with the plow—plowed where the corn was cut.

I then sowed Soule's wheat, at the rate of one and a half bushels per acre, and harrowed it in. Next cut the four rows on each side of where the wheat was sown, and set up those already cut on the ground that was sown, putting in about one hundred hills in a shock, and so proceeded until the field was all cut up and sown. From four to six weeks after, husked and secured the corn and stalks. The stalks well pay for cutting up, husking and securing.

When plowing the ground a man followed and laid all the pumpkin vines in the furrow, and trod them down, so that the plow completely covered them. They are worth more to the land than they take from it.

In cultivating potatoes, the ground was prepared the same as for corn—furrowed with rows three feet apart. The potatoes were cut and dropped, ten bushels on an acre, in the furrow, twelve inches apart, and covered with a plow. Two dressings with the shovel plow, and one with the hoe, was all that they required. When ripe, went through with the common plow, which laid most of them bare. After picking them up, went over the ground with a harrow, and but few of them were left unexposed. This is decidedly the cheapest way that I can raise potatoes. I cultivated for the table early June, Mercer's, Murdock's white; and for stock, Rohan's.

The average product of wheat the past year, was twenty-three bushels per acre; barley, twenty-four and a half bushels; corn, fifty-five bushels; potatoes, one hundred and ten bushels; hay, one ton and a half per acre, as estimated. There were forty-six wagon loads of pumpkins among the corn.

15. For all hoed crops the manure was well covered with the plow. For wheat it was applied as a top dressing, and well cultivated in. This keeps the

Digitized by Google

ground moist and warm, which gives the wheat a better start than where it is covered with the plow.

I applied from twenty to twenty-five loads per acre for the top dressing. All of my ashes were well mixed with plaster, equal parts, and sown in April, on the wheat, at the rate of two bushels per acre.

16. Answered above.

17. My potatoes have been somewhat affected with the rot this year, but not any last year. The poorest soils give the soundest potatoes.

Grass Land.

18. I have no permanent grass land. Clover follows wheat, barley, and oats. Eight pounds of seed are sown to the acre, in March and April, on barley and oats, before the last harrowing.

19. This year I have mowed twenty acres. It was cut in June, and the first week in July. Cured mostly in the swath and cock. The revolving horse rake was used in gathering all my hay. I put no salt on my hay.

20. I have no meadows too wet for wheat.

21. I have no means for testing irrigation on my uplands.

22. There are about sixty acres of swamp on the farm, twenty acres of which are covered with white cedar, tamarack, black ash, and a few small pines. Ten acres of timber have been cut off. Thirty acres of it have been destroyed by water raised by beavers, probably an hundred years ago. Some roots and logs are found mostly covered with muck. Some twenty years ago, I put an open drain around this, which took the water from the surface, and killed the cat-tail flags, while the blue flag, sweet flag, and bullrushes continued to grow with some wild grass. The water of the pond then stood within eighteen inches of the level of the marsh. Three years ago, I expended over a hundred dollars in lowering the outlet of the pond, which placed the land three feet above its level. I then commenced putting in under drains from the pond to the upland. The ground was so soft that the bottom of the drains had to be laid with large flat stones, and in some places plank had to be used instead of stones. The sides were laid with cobbles, covered with long flat stones, and filled up with what was thrown out of the drain. I next made a drain between the high and low lands, to cut off the springs, from two to five feet deep, according to the lay of the land. This drain was laid with stone on the sides and top, as the bottom was hard pan and gravel. These drains have dried the land on the south side of the pond, so that I have plowed some ten acres, subdued the wild grass, and seeded with timothy, which has yielded a fair amount of

Digitized by Google

pasturage the past season. The past fall I have plowed ten acres more, which I intend to try with corn, oats, and roots the next season.

I have put in 585 rods of under drains; of stone 355, of brush 205, and of sod 49 rods. Brush and sod drains are dug three feet deep, fifteen inches wide at the top, and three at the bottom. A bog is cut square,so as to go two-thirds of the way to the bottom, and is driven down with a paver's mallet within six inches of the bottom. The ends are cut square so as to match well. It is then filled up one foot more with earth, well pounded down, and the remainder is merely thrown in. The water passes as well through this as a stone drain. The brush drains are filled from eight to ten inches with brush, from one-half to two inches in thickness, trod down with a little straw or turf on the brush, and then filled the same as the sod drains. Where there is but little water to carry off, brush drains will answer. Sod or stone should be used where the water runs two or three inches deep. My stone drains have cost from twenty-five to sixty-two and a half cents per rod—the sod and brush, twelve and a half cents. All has been put in by my farm hands.

DOMESTIC ANIMALS.

23. Five working horses, one sucking colt, five cows, one bull—yearling past—Hereford breed. The cows are a cross of the native and Devon.

24. I have raised but three cows in seven years, and no cattle for market. Cows for milk and butter are all that I can keep at a profit

25. My cows are kept in the stable through the winter, well littered with straw, and fed with chaff, corn stalks, roots, bran, and corn and cob meal. They are let out two or three hours each day for water and straw, in the yard.

26. We make more butter than is used in the family—sell from one hundred to one hundred and fifty pounds in a year. No cheese is made.

27. The number of sheep averages about three hundred. Last year sheared three hundred and eleven full blooded merinos. Average weight of fleece without tags, four pounds thirteen ounces. Sold for thirty-five cents per pound, twenty-six pounds of tags at ten cents. Reared eighty-seven lambs—most of the buck lambs are kept and sold for bucks. My sheep in wool pay for keeping, and the interest on ten dollars per head. No stock that I keep will pay as well. Ewes come in at the age of three.

28. My lambs and yearling ewes are fed in stalls and let out to water each day. The old sheep are kept in yards with basements to sheds and barns to which they have access, which they well improve, and drop most of their dung there. I have three yards, and one stable, all joining, for three flocks. The

Digitized by Google

feed is put into the empty yard or stables. The lambs and yearlings have the first chance at it. Then the next strongest flock, and then the next. If a flock is not doing well I give corn and cob meal, or bran, or more hay. My feed is chaff, straw, corn stalks, hay, bran, and corn and cob meal. Salt is placed where they have access to it each day. My loss is one and a half per cent. yearly, one-half of which are lost in the lambing season. I have kept the long wooled sheep three or four years. They are not as hardy as the merinos—will not yield as much wool, mutton, or tallow from the same feed as the merinos. Merino wethers when fit for the butcher weigh about sixty pounds when dressed—old ewes fifty pounds.

29. My hogs are of the Leicester and Byfield stock. I raise from eight to twelve pigs annually—keep over winter from four to five, which are fatted and butchered from eighteen to twenty months old. The pigs are sold from six to eight months old. The fat hogs when dressed generally weigh from four to six hundred pounds. While growing they have the run of the orchard, and the slops of the kitchen, with some corn meal in it. While fattening, corn and water, and sometimes meal made into pudding, fourteen pounds to fifty-six pounds of water, will make a pudding, which, when cold, will be thick enough to cut. This is the best feed for fattening hogs that I have tried.

30. I have cultivated the ruta baga, mangel-wurtzel, and sugar beet, which I have rejected for the Aberdeen turnip. They require too much labor for their value. I intend to try the carrots next season.

FRUITS.

31. When I came into possession of the farm there were no fruit trees on it. I set out two hundred and fifty apple trees.

32. Two years after, I cut off every tree and grafted them with the following varieties: Harvest apple, Sweet Russet, Sweet Greening, Rhode Island Greening, Golden Russet, Cabbashee, Vandevere, Gilliflower, Twenty ounce apple, Fall Pippin, Pound apple, English Russet, Tallman Sweeting, Golden Sweeting, Queen Ann, Jersey Sweeting, and Harrison apples. Almost every year since, I have been putting in new and improved varieties, by cutting off former ones, so that I have in all about forty varieties. I have also, pears, peaches, plums, cherries, and grapes of the most improved varieties sufficient for the use of the family.

33. Plums are injured some by the curculio.

34. Plowing and manuring have kept the trees thrifty.

35. Some of my experiments have been given above, and others that have failed are not worth noticing.

Digitized by Google

36. My farm buildings are given below in the diagram.

37. My farm is well fenced with five hundred and thirty-two rods of stone fence—built three and a half feet in height, with post and two boards on the top, fastened with nails at a cost of a dollar per rod; ninety rods of posts and boards at a cost of eighty cents per rod; eight hundred and sixty-five rods of rail fence of white cedar, most of which is staked and capped, at a cost of sixty-three cents per rod. Have sixteen substantial farm gates, well hung at a cost of five dollars per gate.

38. My grain was all measured or weighed, that was sold. Of what was consumed on the farm no account was kept. I keep an account of all sales, receipts, and expenditures of the farm, and family. Sell for cash, pay cash, and have no accounts at the stores, or mechanic's shops.

39. Expenses of cultivating nine acres of wheat with one plowing, on a clover lay where hay had been taken off the same year, viz:

A man with three horses and plow, seven days at $2 per day...	$14 00
A boy with two horses, rolling, cultivating and harrowing, three days at $1 per day, ...	3 00
Man and team drilling in, ...	1 00
Nine bushels improved wheat, prepared at $1.25,.....	11 25
Harvesting and shocking, 58 cents per acre,.....	5 22
Nine bushels of plaster and sowing,.....	2 00
Seventy-two pounds of clover seed and sowing,.....	5 25
Interest on nine acres at $70 per acre,.....	44 10
	$85 82

Receipts from the above nine acres of wheat,

Twenty-three bushels per acre is 207 bushels at $1.12½,.....	$232 87
Expenses as above, ...	85 82
Net profit, ...	$147 05
Average net profit per acre,.....	$16 34

Expenses for the past year.

One man by the year,.....	$150 00
One man seven months at $12,.....	84 00
One boy six months at $6, ...	36 00
Twenty-eight days work at $1.25, ...	35 00
Fifteen " " shearing and tying up wool, $1.25,....	18 75
Hired girl a year,.....	57 00
Blacksmith's work, furnishing and repairing farm tools, ...	97 00
Clothing, furniture and groceries,.....	251 00
Clover seed, six bushels at $4 per bushel,.....	24 00

Digitized by Google

Seven and a half tons of plaster at $2 per ton,	15 00
Eight tons of shorts at $7 per ton,	56 00
Town and county taxes,	52 75
School bill,	3 00
Agricultural papers,	6 00
Religious "	5 00
Political "	4 00
Expenses attending fairs,	21 00
Total expenses,	$915 50

Profits of the Farm.

1,400 bushels wheat sold at $1.12½,	$1,170 25
1,496 pounds wool sold at 35 cents,	513 80
26 " do (tags) 10 "	2 60
29 bucks sold, averaging $12 each	348 00
24 sheep pelts,	18 75
28 ewes sold (part old) $3 per head,	84 00
215 pounds tallow sold at 8 cents per pound,	16 20
Beef and hide,	18 62
Veal and skins,	16 70
Two fat hogs, 1,110 pounds at $4.50 per 100,	49 90
Turkies and chickens sold,	11 87
117 dozen eggs, at 11 cents,	12 87
109 pounds of butter at 12½ cents,	13 62
Honey sold	11 00
Onions,	7 00
Garden seeds,	2 50
75 bushels barley for sale at 70 cents,	52 50
100 " corn " " 50 "	50 00
Apples sold and for sale,	23 00
Aberdeen turnips sold,	8 75
Houses rented,	90 00
Seven shoats,	27 56
Total receipts,	$2,548 99
Expenses as above,	915 50
Net profits,	$1,633 49

(Signed) RAWSON HARMON.

Digitized by Google

WHEATLAND, *Jan. 6th*, 1851, *ss.*

Rawson Harmon being duly sworn, says, the facts set forth in the foregoing statement by him subscribed, are true according to the best of his knowledge and belief. (Signed.) RAWSON HARMON.

Sworn this 6th day of January, before me. }

(Signed) JOHN J. BLACKMER, *Justice.*

DESCRIPTION OF MIDDLEBROOK FARM,

Property of Daniel D. T. More, and its Method of Cultivation.

The farm that I am offering to your consideration is situated in the town of Watervliet, on the Albany and Mohawk Plank Road, two miles from the city of Albany. It has for the past fifty years, and until I purchased it, been under a most destructive system of cultivation, having been on lease, and every tenant worked upon the principle of getting the most he could from the farm, without any suitable regard to the improvement of the soil. When I entered upon the farm, the buildings and fences had all rotted down, or become nearly worthless. The dwelling house that was on the premises I sold for fifty dollars, to be taken away. The barn, being of trifling value, I pulled down; the fences were all taken off by the previous occupant, who had been upon the place for sixteen years, at a rent of one hundred dollars per annum, which he complained of as a very high rent.

I purchased it in May, 1845, five years ago, but did not take possession until the following November. I bought the place against the advice of all my friends, as they supposed that it would be impossible for me to live upon it, much less make it profitable. I paid all the money that I had, or could raise, upon the purchase money, and it left me more to pay, as interest, than the former occupant paid as rent.

The land was so much exhausted, that for the first two years almost the only crop I could raise was white beans. But, notwithstanding, I have since put up my buildings, fences, and all other improvements; have paid the interest, and reduced the principal remaining on the purchase, besides this year's profits. I have not, in the annexed statement, charged any thing for the services of myself or family, but I have defrayed all family expenses. My family consists of wife and five children, the oldest but fourteen years old, so that my children have been of but little assistance to me, the balance of account being decidedly against them. I make the above statements, in order that you may see the disadvantages I have had to labor under, and not expect my farm to produce as largely as richer and stronger soils. You will see by my crops that I have not paid much attention to

Digitized by Google

gardening, as I have farmed with a view to profit, and the improvement of my farm, believing that every hundred dollars laid out on the permanent improvement of my farm is more safely and profitably invested than depositing it in the Savings bank. I have expended much labor and money on my fruit trees, which as yet have afforded me little or no profit, but flatter myself they soon will be my best investment.

Accompanying this communication, I annex the affidavit of Mr. Shadwick, who lived on the farm when I purchased it. Also, a letter from Mr. Lansing, the agent of the Hon. Stephen Van Rensselaer, from whom I purchased it, and a statement from two of my neighbors, who have known the place for more than twenty years. These will show you that my farming operations have not been conducted upon the best lands in the state, but on the contrary, on lands approximating to the poorest.

Yours respectfully,

(Signed) D. D. T. MORE.

To the Committee on Farms, of the N. Y. State Ag. Society.

STATE OF NEW-YORK, }
City and County of Albany. } *ss.*

Daniel D. T. More, of the town of Watervliet, county of Albany, being duly sworn, deposes and says, that the facts stated and set forth in the above communication are true, to the best of his knowledge and belief.

Sworn to before me, this 8th day of January, 1851. }

(Signed) JAMES B. SANDERS, *Commissioner of Deeds.*

WATERVLIET, Jan'y 4th, 1851.

MR. D. D. T. MORE:—Sir—With regard to your inquiries concerning my crops, on the farm upon which you now live, while I occupied it, I cannot give you any exact statement at this time; but I will undertake to give a general statement, which may perhaps be satisfactory to you.

I occupied the farm sixteen years previous to your purchase. The farm was all the time in market. I was, as it were, a tenant at will; so you will perceive that I had no incentives to improvement, so that the farm rather deteriorated under my management. I farmed it with a view of getting the most from it with the least possible expense. I paid one hundred dollars a year rent. Some of the land was new when I went upon it, and it paid me very well; but for the last few years the land was so worn down that I no longer considered it an object at the price I paid. With regard to the amount of sales of produce, I did not keep an account of sales, but, judging from the expenses of my family, before and since I left the place, I should think I must have sold about four hundred dollars worth

Digitized by Google

yearly. I carried on gardening to some extent, and I worked the farm in the way that I thought would pay me the most profit. I do not think that I left the farm any better off than when I came upon it, sixteen years before. I did not suppose the farm was capable of doing what I see you have made it do.

Yours, truly,

(Signed) JOHN SHADWICK.

STATE OF NEW-YORK, }
City and County of Albany. } *ss.*

I, John Shadwick, of the town of Watervliet, county of Albany, being duly sworn, depose and say, that the facts stated in the above document are true. (Signed) JOHN SHADWICK.

Sworn to before me, this 4th day of Jan'y, 1851. }

JAMES B. SANDERS, *Commissioner of Deeds.*

ALBANY, Jan'y 8th, 1851.

MR. D. D. T. MORE:—Sir—We have been acquainted with the farm in Watervliet, county of Albany, on the Albany and Mohawk Plank Road, (owned and occupied by you,) for the last thirty years. Up to the time you purchased it, some five years ago, it was in a very poor and worn out state. The fences were very poor. The buildings on it not worth more than one hundred dollars. There was no well or water on the farm, very few fruit trees, and they were in an uncultivated state. The produce of the farm, at that time, could not have exceeded four or five hundred dollars. The farm at the time you purchased it had been leased, and the tenant did not improve the farm, and it gradually run down.

Yours, truly,

(Signed) ELIJAH GROVE,
JOHN LEVINGS.

STATE OF NEW-YORK, }
City and County of Albany. } *ss.*

John Levings and Elijah Grove, both of the town of Watervliet, being duly sworn doth each for himself say, that the facts stated in the above letter are true.

ELIJAH GROVE,
JOHN LEVINGS.

Sworn to before me, by both deponents, on the 8th day of January, 1851. }

JAMES B. SANDERS, *Commissioner of Deeds.*

DECEMBER 28th, 1850.

MR. D. D. T. MORE:—Dear Sir—In regard to your inquiries about the farm that you now own and occupy, I have to say that I have known the farm for many years; it was occupied by Mr. Shadwick for twelve or fifteen

Digitized by Google

years before you purchased; the farm was held for sale for several years before you bought.

Mr. Shadwick not being able to purchase, could not manage it as an owner would; consequently the farm run down. When you purchased, the land was considered worn out. An owner with some capital and energy was wanted, to manage it, and I am glad that it fell into your hands. Your management and perseverance have given value, not only to your own land, but to much in a similar situation in the vicinity. I hope you will persevere, and show to your neighbors that energy and modern improvements must succeed.

I am not a practical farmer, but I love to see judicious improvements going on in a district in which I have lived for so many years. I consider the influence of one farm, properly managed, on a town, or district, as greater by far than many dream of. Yours, truly,

(Signed) A. D. LANSING.

Answers to the questions required in the Premium List, for the Cultivation of Farms:

1. My farm consists of one hundred and eighty-five and a half acres of land. No waste or wood land.

2. Soil, a sandy loam; subsoil, principally a coarse sand; am not aware of any limestone existing on the farm; no stones worth mentioning.

3. I found the best mode of improving my land was by plowing under green clover, the growth of the clover was much aided by a liberal application of plaster, say 250 lbs. per acre.

4. My experience is decidedly in favor of deep plowing—not less than eight inches, and often deeper.

5. Have never made any experiments with shallow plowing, as I am too much in favor of deep plowing to *even* experiment in shallow plowing.

6. I have never tried the subsoil plow, but intend to try the experiment another year. If I was on a clay soil, would not be without one. Have not drained any of my land. Have no land on which surface water stands.

7. Yellow and white pine, white and black oak, scattering hickory, poplar and sassafras trees, were the principal trees originally. Sorrel and couch grass were the principal weeds.

MANURES.

8. I find from my experience I derive the most benefit by applying manure as a top-dressing. I use much of my manure on my rye crop, in the following manner: After the grain is harrowed in, I apply from twenty to twenty-five loads of manure, (double loads, say thirty bushels each,) spread

Digitized by Google

evenly over the surface. I have never failed to get a good crop of rye. The grass seed is sure to take, and the growth is much aided by the manure; the clover being plowed in leaves my land in excellent condition for a crop of corn. I manage my manure by heaping in the yard, turning it, and keeping it covered with earth, to prevent as much as possible the escape of the gases. I have no cellars for manure under my barn, but have cisterns for collecting the urine.

9. My means of making manure are from the keeping of about thirty head of cattle, and from four to six horses, and mixing in various ways, all the straw that my farm produces. I make in this way about three hundred loads of manure, and usually buy as much more.

10. I prefer to have my manure pretty well rotted. My usual mode of applying manure has been as follows: Plow under clover, plant corn, follow with potatoes, and then rye, with a top-dressing of manure, not so much for the benefit of the rye as for the clover, and future crops. I am satisfied that my land has improved rapidly from this mode, in fact at such a rate that I shall not be able to follow it, so far as the rye crop is concerned.

11. I am not aware of any way of increasing manure cheaper than by purchasing it, being so near to Albany, where it can be bought from twelve to thirty-seven cents per load.

12. I have used lime, guano, and plaster. Lime I have applied to a considerable extent, usually as a top-dressing. Have used plaster, principally upon clover, with much benefit. Guano I consider too dear for common use. Stable manure and lime I consider the cheapest, considering their effects.

13. I tilled one hundred and forty-four acres this year, as follows: ten acres of wheat, thirty-five acres of rye, twenty-seven acres of corn, thirty-five acres of buckwheat, twenty acres of potatoes, twelve acres of broom corn, one acre of sowed corn, two acres of melons, fifty rods of asparagus, and one and one-half acres of strawberries.

14. I have cultivated wheat more as an experiment than anything else, as for the last few years it has been almost a total failure in this section of the country. My manner was as follows: I sowed after potatoes spring wheat, of the Black Sea variety, about the 15th of April; harvested about the 4th of August, at the rate of six and a half bushels per acre. In the cultivation of my rye crop, for experiment, I sowed part of it after potatoes, and part on a clover lay; sowed the last week in August and the first week in September, one and a half bushels to the acre; harvested about the 15th of July; product seventeen and a half bushels per acre. The crop was much injured by a hail storm in the latter part of June, to the ex-

Digitized by Google

tent I think of eight or ten bushels per acre. I did not discover much difference between the manured potato ground, and the clover lay, which confirms my previous opinion, that a clover lay plowed under, is about equal to a dressing of manure.

I cultivated corn as follows: twenty-two acres on clover lay, part plowed in the fall and part in the spring. After the clover had got about ankle high, I plowed it deep, passed over with the roller, harrowed well, marked both ways three and a half feet apart, and planted from four to six seeds in a hill; planted the last days of May and first of June; as soon as I could see the rows I went through with the cultivator, in about a week after, went through with the cultivator again, followed with the hoe, making it perfectly clean, and thinning it to four stalks in the hill I kept the cultivator stirring the ground as much as possible, till the corn was about three feet high, then went through with the shovel, plow, and hilled moderately. As soon as the corn was glazed I cut it up by the ground, and set it up in small stooks. I consider stalks are the most valuable cured in this way. I planted part of the eight-rowed white, and part of the eight-rowed yellow. I found the yellow corn some ten days the earliest, but the white yielded the best; I did not keep it separate. The whole averaged fifty-six bushels per acre. Five acres of sweet corn I planted the first days of July; the ground was well manured by top-dressing, cultivated the same as the common; picked from the 15th to 30th of October. It sold in the market principally, at 62½ cents per hundred ears, amounting to $257.33. The stalks are much more valuable than the other corn, as they contain a larger proportion of saccarine matter.

I sowed this year thirty-five acres of buckwheat; after mowing, I turned under a clover lay, and sowed between the 15th and 20th of July, about three pecks to the acre. Harvested about the 10th of October; produce eight hundred and thirty-one bushels, twenty-three and three-quarter bushels per acre. On fifteen acres of the buckwheat I sowed rye with the buckwheat, which looks well, and bids fair to be a good crop.

I cultivate potatoes as follows: generally plant after corn, in hills, about three feet apart each way. If my seed is large I cut and put three pieces in a hill, covered about three inches deep. I tend them principally with the cultivator and plow. I usually plant Mercers principally. Planted this year Mercers, Long pink eyes, and the Weaver varieties. Planted early in May. In consequence of the backwardness of the spring planted later than usual, but prefer early planting. The Mercers and pink eyes suffered much with the disease. The Weavers escaped almost entirely, and produced one hundred and twenty-five bushels per acre. They are a very good potato.

Digitized by Google

This year the potato disease has been more destructive than any previous one.

I cultivated twelve acres of broom corn, on an island in the Hudson river. In consequence of the late spring freshet, I planted the first week in June, ground plowed deep, well harrowed, rolled and marked three feet apart, and planted with Campfield's Drill Barrow, hills eighteen inches apart' ten seeds in the hill, it was tended much the same as Indian corn, cut when the seed was in the milk, cleaned and cured in the shade, to keep the brush green. My usual crop is about seven hundred pounds per acre. This year, in consequence of having been twice overflowed, the crop is much injured, and will not yield more than four hundred and ten pounds per acre.

One acre of corn I sowed for fodder. Sowed the last of July, cut and fed to the cows through the month of October. I find it excellent for late green feed.

I cultivated two acres of melons; watermelons, citron melon, and preserve citron. Planted the first of June. After the land was put in good order by deep plowing, I marked out the ground six feet apart each way, and put three shovels full of street manure in a hill. I planted at least twelve seeds in a hill. Calculated about two-thirds to be lost by the bugs. The produce was very large, as the family consumed many, many were pifered and given away, and sold over one hundred dollars worth.

Fifty rods of asparagus, I cultivated as follows: sowed the seed, transplanted the third year to the bed for cutting. I prepared the bed by plowing deep, and highly manured with well rotted manure, when the bed was thus prepared, I took a large plow, and struck a furrow, about twelve inches deep, set my plants in the bottom of the furrow about ten inches apart, cover, then struck the second eighteen inches apart from the first, and so on until all are set. Topped dressed with well rotted barn-yard manure and salt. My asparagus was of an extraordinary size, and quality. Sold $69.66 worth at eleven cents per bunch, besides what was used in the family. I cannot tell how much fertilizing matter is taken from the soil to produce twenty bushels of wheat. I wish I could.

I have have cultivated usually about an acre of strawberries, with success and profit. I have cleared over two hundred dollars in one year from one acre. My mode of cultivation is to take a clean piece of land in good condition, plow it very deep, harrow thoroughly, and spread evenly from two hundred to three hundred bushels of leached ashes, to an acre, mark the land in drills three feet apart, and insert the plants from eight to twelve inches apart in the drills. I transplanted in April or early in May. I obtained no fruit the first year of consequence. I cultivate between the rows,

Digitized by Google

as long as I can get through with the cultivator, and then let the vines run together, they will cover the ground entirely by the first of August. I do nothing with them again until the next spring, when I take a double team and heavy harrow, and go over the beds thoroughly, until the plants are sufficiently thinned, this loosens the ground, and takes out all the weak plants. If the ground does not appear to be sufficiently rich, I apply another dressing of leached ashes; after this is done, the ground is laid off in beds, about five feet apart, and nothing more is done till the frust comes to maturity. After the fruit is gathered, the beds are cleared of weeds, and left till the next spring. The second year, I repeated the above method.

One great benefit I find in using ashes as a manure, is that it brings no weeds. I consider strawberries one of my best crops. I failed, however, entirely in my crop this year. I had one and a half acres of the pine apple variety, a variety much recommended for its prolific crops, and the superior quality of its fruit; my beds never looked so well as they did last spring, blossomed finely, and bid fair for an abundant crop, but after blossoming no berry appeared, and I had therefore a most splendid failure. I had not a full grown, perfect berry in the whole field, they were all pistilate plants. I have been setting rows of the Iowa variety through them, with the hope of better success next year.

15. I like barn-yard manure well rotted, and in most cases applied as a top-dressing.

16. For my soil and fields, I prefer top-dressing.

17. My Mercers and pink eye potatoes were mostly destroyed by the disease. I only got about twice as many as I planted. I am sorry to say that I have not been able to discover the cause, nor a remedy for the disease.

18. I usually sow clover and timothy seed on winter crops. Timothy in August and September, clover in April. Four quarts of timothy, and usually twelve quarts of clover to an acre. My land being upland, I prefer timothy and clover for pasture.

19. I mowed thirty-two acres this year, and averaged about one and a half tons per acre. I cut clover when the heads begin to brown, and timothy when in full blossom. Cure as much in the swath and cock as possible. To preserve the color and keep the leaves from shelling, salt it in the mow, at the rate of about four quarts to the load.

20. None of my mowing land is unsuitable for the plow.

21. I have no bog, or low land.

22. I have not practiced irrigation, not having any running water on my farm by which it could be done.

Digitized by Google

23. I have not any noxious weeds that annoy me. Couch grass is the worst, but I have pretty well subdued that by severe hoeing.

24. I was in the milk dairy business till last October, when I sold out. For the last two years previously I kept on an average about thirty cows. Since then seven. Nineteen I pasture for others. I keep for use on the farm four mules, one horse, and one yoke of cattle. My cows are of the native breed.

25. I have made no experiment in the breeding or use of cattle. Have used for farm work, horses, mules, and oxen. I prefer mules for general farm purposes. Oxen the second best. I consider two mules as good, and will do as much work as three horses. I can keep three mules as cheap as two horses, besides saving much in shoeing, and costing nothing for farriery; they will work when very old, and I could not be induced to do without them.

26. I stable my cattle, and cut my feed principally, and give them as much as they will eat clean. Water in the stable.

27. Made little butter last year, but more than I used in the family. I make no cheese.

28 & 29. I keep no sheep.

30. I usually keep or winter two breeding sows, a cross of the Cheshire and grass breed, and fatten and kill the spring pigs. They weigh from two hundred to two hundred and fifty pounds, when eight or nine months old.

31. Have made no decided experiment in raising or feeding root crops, but from what I have tried, prefer the carrot.

32. I have had one thousand apple trees set in the last two years, all grafted from the choicest varieties, but they have not of course had time to bear any fruit, and therefore cannot tell what kinds will prove the best adapted to my soil.

33. I have twenty-two hundred peach trees, of the following varieties: Honest John, Oldmixon Freestone, Morris White, President, Crawford's Late Melocoton, Rose peach, and several other varieties. All budded, but have not had a general crop yet, so am not prepared to say which kinds I prefer for this locality. The trees are all vigorous and healthy.

I have over two hundred plum trees, a general assortment of what are reported to be the best varieties. They have been set but two years.

I have two hundred of young apple quince trees, that have not borne yet.

I have nearly one hundred pear trees of choice varieties.

I have a number of cherry trees of the dwarf and standard varieties.

Also most of the different varieties of currants and gooseberries.

34. The depredations of the common peach worm I prevent by digging round the trees twice a year, and destroying them. This is the only trou-

Digitized by Google

blesome insect I have had so far, except the common caterpillar, which is easily got rid of.

35. I keep the ground cultivated for two or three feet round the trees, and keep the ground covered with compost, when the orchard is in sod, which is not more than one year in four. I endeavor to keep my orchard well manured. I wash my trees with a preparation of lime and oil of soap, which keeps the bark smooth and thrifty.

36. I do not think of any experiment that would be useful or interesting.

37. I have a story and a half house, 24 × 36 feet, with kitchen back, 18 × 30 feet, 12 feet taken off for store room. The upper part of my main building is devoted entirely to sleeping rooms.

My main barn is 30 × 80 feet, standing upon a side hill of gentle slope, end towards the hill; under the end where the ground is lowest, I take off twenty feet for a horse stable, making room for seven head of horses; the next twenty feet is a root cellar; the remaining forty feet is a cow stable, with cisterns underneath for catching all the water that falls on the building. My water cistern occupies about twenty-four feet under this stable, and will hold something like two hundred hogsheads; the other sixteen feet is occupied by a cistern for collecting the urine from the stables, the floor being caulked and pitched, with a trough behind the cattle to conduct their urine to the cistern.

My manner of building the cisterns is this. I dig out the earth, of the requisite shape and dimensions, take cement and coarse sand of equal parts, mixed with water, and spread evenly about half an inch in thickness all round the sides, and on the bottom, and cover with planks, with earth over them. A cistern of the capacity of one hundred hogsheads can thus be built, with pump, complete, for less than twenty-five dollars.

The cow stable is arranged to accommodate twenty-four head of cattle in two rows, with an alley way between. The sides are filled in with brick. One part of the barn, over the horse stable, I use for hay, and the remainder of the space, over my thrashing floor and cow stable, for grain and fodder. Attached to my barn I have on the north a wagon house and tool shop, 18 by 50 feet, with room overhead for hay and grain, opening into the main barn. To the south of the main barn, attached in the same way, is a building 18 by 100 feet; fifty feet is occupied as a cow stable, the remainder is open shed, with room overhead same as north wing. To the south of the southern shed I have my hen house, 12 by 18 feet, with large windows on the south side, to admit light and warmth. East and south of this shed is my barn-yard, protected from the north and west winds. The

Digitized by Google

yard contains about three quarters of an acre, divided into two parts, the front one for most common use; in the rear one I have four barracks for coarse feed, where I fodder in the middle of the day in pleasant weather. East of my barn, some forty feet, I have a wagon house, 28 by 36 feet, with corn house and granary overhead. About one hundred and fifty feet in the rear of my house I have a shop 16 by 24 feet, story and a half, with sleeping rooms overhead.

38. I have but one kind of fence, post and board, or plank, principally chestnut posts, and inch and a quarter culled spruce plank, four planks high, of which I have sixteen hundred and eight rods, costing about eighty cents per rod. I have no wire fence, and have seen none that I admire. My fences are all in good condition, all having been built within the last five years. As an evidence of the good quality of my fence, I have not received a shilling's damage to my crops for the last year, from either my own or neighbors' cattle.

39. I measure my grain, seed, and potatoes; weigh my beef, pork, and hay, and keep an account of all.

40. I keep a general farm account, of all my sales, receipts and expenditures, and can strike a balance at the end of the year, and thus ascertain my profits or losses. I have not kept an account for each field or crop, to ascertain the relative profits of each crop, but think I should have done so, and intend to do it the coming year.

Account of Expenses of Farm.

407 days labor at 50 cents,	$203 50
Yearly and monthly labor,	665 00
One girl one year,	52 00
" four months,	16 00
500 bushels of oats at 41 cents,	205 00
Blacksmith's bill,	97 81
Grocery, shoe and dry goods bill,	357 90
12 bushels grass seed at $2.25,	39 00
10 " clover seed at $4.50,	45 00
12 " seed wheat at $1.25,	15 00
Seed corn and garden seeds,	10 00
26 bushels seed buckwheat at 62½ cents,	16 25
State and school taxes,	31 22
Insurance in Mutual Insurance Co., average about,	4 50
Depreciation of farming tools,	100 00
Two tons of plaster,	10 00

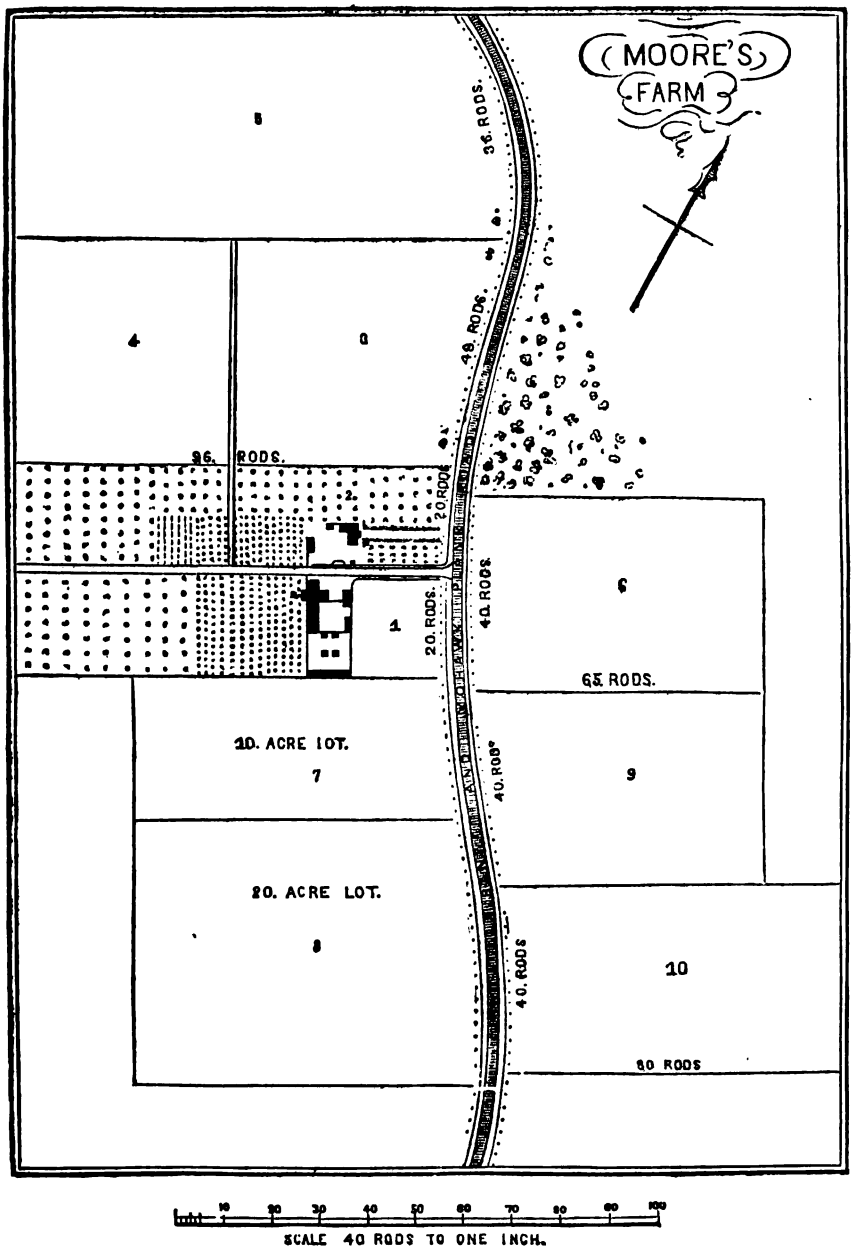
Digitized by Google

GROUND PLAN OF BARN YARD, &C.

Digitized by Google

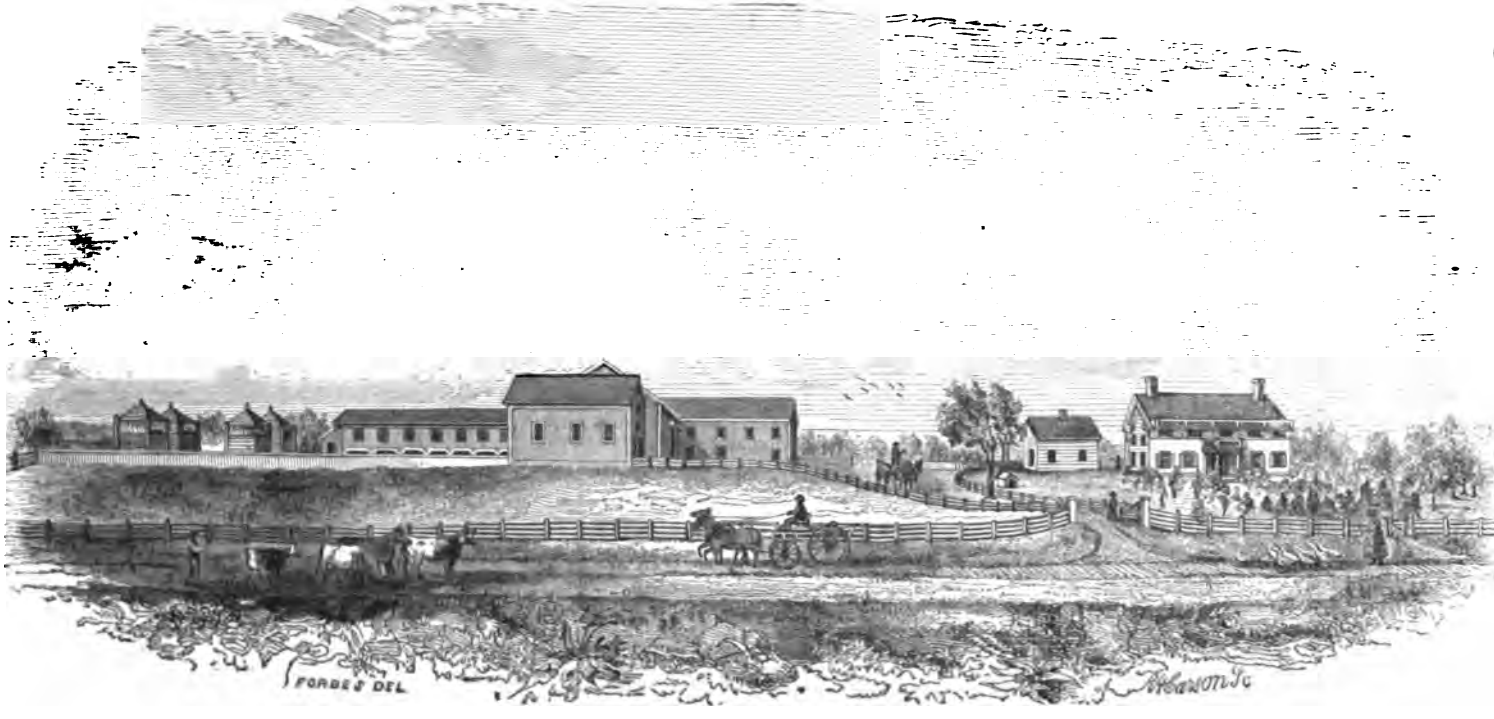
Digitized by Google

Digitized by Google



PLAN OF MIDDLE BROOK FARM, (D. D. T. More) Watervliet.

Digitized by Google



PLAN OF FARM BUILDINGS, (D. D. T. Morr's) Middlebrook Farm, Watervliet.

Digitized by Google

Digitized by Google

1000 bushels of lime at 4 cents,	40 00
Grains for cows,	191 17
Hay bought in April last,	75 00
Total expenses for current year,	$2,174 35

The above includes all farm and family expenses, with the exception of doctor's bill and church expenses.

Account of Receipts of Farm.

633 bunches asparagus at 11 cents,		$69 66
Received from produce of 5 acres sweet corn,		257 33
610 bushels rye at 69 cents,		410 90
Melons, pumpkins and citron melons sold,		148 00
831 bushels buckwheat at 44 cents,		365 44
Raspberries sold,		31 25
Potatoes (including those unsold,)		100 00
1240 bushels of corn at 65 cents,		806 00
Milk sold from an average of 30 cows, nine months,		1,629 81
Sixty-four bushels, 35 lbs. wheat,		64 62
Five loads of hay,		40 00
Five loads of straw,		5 00
Broom brush 4920 lbs.,		250 00
Pigs sold,		40 00
Surplus of straw,		100 00
Surplus of corn stalks, part sold,		100 00
Twelve tons of clover hay at $6,		72 00
Chickens and eggs sold,		40 00
140 pounds butter at 18¾ cents,		26 25
Peaches sold,		10 00
Pie plant,		11 25
Twenty-five calves at $1 each,		25 00
Received for pasturage,		18 50
Received for work done by teams and men during the State Fair,	$117 30	
Received for labor done for S. Van Rensselaer,	114 00	
		231 50
Total receipts for current year,		$4,852 51
Less expenses per account,,		2,174 35
Net profits current year,		$2,678 16

Digitized by Google

STATE OF NEW-YORK, }
City and County of Albany, } *ss.*

Daniel D. T. More, of the town of Watervliet, county of Albany, being duly sworn, deposes and says; that the facts set forth in the foregoing statements and schedules are true to the best of his knowledge, information and belief. (Signed) D. D. T. MORE.

Sworn to before me this 8th }
day of January, 1851. }

(Signed) JAMES B. SANDERS, *Commissioner of Deeds.*

(The farm of Mr. More is entitled to special consideration. It had been for years under rent, and a system of exhaustion had been carried on, until it was not considered an object with the tenant to rent it at one hundred dollars a year. Mr. More took the farm in this condition, and in five years time has thoroughly renovated it by a judicious system of deep plowing and manuring, and a proper rotation of crops. This farm is situated upon the light sandy soil near the city of Albany, and the operations of Mr. More show that this land may be made nearly as productive as the best soils in other sections of the State. The application of green manure and plaster has proved well adapted to reclaim this exhausted soil. This example is of great importance, in establishing as it does, the great advantage that results from the ownership of the soil. While this farm was in the occupation of tenants, its products it will be perceived amounted to but about four hundred dollars a year, and in five years after it came into the possession of Mr. More, the proceeds of the farm amounted to $4,852.51. The influence of one such effort in a town is much greater, as remarked by Mr. Lansing, than "many dream of"—and we are assured that the result in this case has given a new impulse to the sale of lands in this region, at far better prices than could be previously obtained.)

THE CYPRESS FARM.

Elisha M. Bradley, East Bloomfield, Ontario co.

To the committee of the New-York State Agricultural Society to award premiums on the management of farms, the undersigned would respectfully submit the following statement:

SOILS, &c.

1. My farm, which may be designated as the *Cypress Farm*, (having a native cypress tree growing upon it,) consists of one hundred and fifty acres; sixty-six of which is plow land, twelve acres are low meadow and pasture land, sixty acres are in timber, and the remaining twelve acres are waste land, including road.

Digitized by Google

2. My soil is a gravelly loam, in some places merging to sand, and in others tending a little to clay; is from six to twelve inches deep, and rests upon a subsoil of red clay.

Limestone abounds in the soil, and upon a low part of the farm a quarry has been opened, yielding a plentiful supply of limestone, used for building, and when burnt yields a highly valuable lime for masonry.

Rocks do not appear frequent. An occasional fragment of granite, silica, flint, and a coarse red sandstone are the principal varieties.

3. Plentifully manuring with well rotted manure, thoroughly mixing the manure with the soil, by means of the plow, cultivator and harrow, is esteemed the best manner of improving the soil.

4. The usual depth of plowing is as follows: for corn, from six to eight inches; for potatoes, oats, barley, peas and wheat, from eight to ten inches. Repeated experiments have established it as a fact, that thorough, *deep* tillage ensures the best crops.

5. I have repeatedly experimented in shallow and deep plowing for growing barley, oats and wheat, and the result has ever been decidedly in favor of deep plowing.

6. I have used R. C. Stiles' pattern of subsoil plow, which raises the ground and pulverizing it, allows it to fall back in the furrow. I last spring put the subsoil after a common plow, which turned a furrow ten inches deep, upon corn stubble, which I was preparing for barley. The subsoil plowed a furrow some eight inches deep, pulverizing the ground thoroughly to the depth of eighteen inches, with the exception of a small part of the field, which was not subsoiled, and from the time the grain was four inches high until harvested, a very great difference was observable in the appearance of the grain. Upon the part subsoiled the grain was healthy and remarkably stout; whereas upon the part not subsoiled it was scarcely a medium growth. Similar results have been obtained with peas and oats.

I have not drained any land. Have but little land that could be improved by draining. On soils surcharged with moisture, money cannot be expended to better advantage than by digging drains.

7. The portion of my farm best adapted to tillage was formerly covered with white oak, with some black oak and walnut interspersed. Butternut, beach, ash, cherry, maple, elm, ironwood, basswood and white wood are found upon my timbered lands, whilst a few acres of swamp land is covered with white cedars, highly valuable for fencing material.

Of the plants indigenous to my farm I can enumerate but few. Among them are found the burdock, narrowdock, catmint, motherwort, pokeroot, mayweed, crowfoot, white daisy, mandrake, wild turnip, putty root,

Digitized by Google

blood root, strawberry, addertongue, sarsaparilla, goldthread, ginseng, lungwort, wakerobbin, rushes, sweet and cat tail flag, numerous varieties of grasses, gooseberries, raspberry, blackberries and hazlenuts

MANURES.

8. Manure is mostly applied to hoed crops, upon which are applied forty loads (of thirty bushels per load) per acre. Manure is made in compact places as possible, and is either kept in as large heaps as possible, or under ample sheds, which are provided for all my cattle and sheep. Sheds and yards are kept thoroughly littered, and each yard has a basin into which the liquid excrements of the stock, and rain water, are conveyed, and there taken up by coarse litter. At the close of the foddering season, the scattering litter and manure is gathered up and put under the sheds, or in compost heaps until rotted.

9. My manure consists of the droppings of horses, cattle, sheep, hogs, and poultry, mixed with refuse straw, leaves, and every other available substance convertible into manure. The accumulations in the privy, together with the carcases of dead animals, plaster, muck, leached ashes, and almost every substance, (lime excepted,) find a place in the compost heap, and add much to the fertilizing products of the farm. A great amount of straw has been annually consumed on the farm, and is fed to sheep, cattle and horses, and freely used as litter. For the purpose of increasing the amount of manure for the farm, crops have been sown upon shares on other farms, and the grain drawn home and thrashed, and the straw consumed upon the farm. I manufacture about three hundred and fifty loads of manure annually, and apply about four hundred, the balance being purchased of my neighbors.

10. Manure is applied rotted. If found necessary to use unrotted manure, it is applied to a corn crop, in the manner noticed under the head of tillage. For top dressing upon meadows it is used thoroughly rotted.

11. If I knew how to increase my annual supply of manure cheaply, I should gladly do so; and yet I think we know but little of the capacity of our farms for manure.

12. I use annually about three tons of plaster upon my grass lands, hoed crops and wheat. Salt has been occasionally used, and once upon corn with satisfactory results. Leached ashes have been applied as a top dressing upon meadow, and plowed in before root crops, to good advantage. Common wood ashes, unleached, are annually applied to corn, just as it makes its appearance above ground, and gives it a healthy appearance, and I think prevents worms from attacking it.

Digitized by Google

TILLAGE CROPS.

13. Sixty-six acres are under the plow, and as far as possible are under the following rotation;

1st. Manure heavily, and plant to corn, or some hoed crop.

2d. Succeed the following spring with barley, oats, and peas.

3d. Sow to wheat in the fall, and seed to clover and timothy.

4th. Cut a crop of grass for hay, and crop of clover for seed

5th. Seed each season for two years.

6th. Pasture for one season, and then manure heavily and plant to corn, following again the above rotation, which occupies six years, and upon my farm gives me eleven acres for hoed crops; eleven acres for barley, oats, and peas; eleven acres for wheat; twenty-two acres for meadow, and eleven acres for pasture, annually, upon plow land.

14. As to the amount of seed used, the time of sowing, and mode of cultivation, &c., the following is the course pursued.

Corn is planted upon highly manured greensward, plowed six or eight inches deep, thoroughly harrowed, marked in *straight lines*, three feet apart each way. Five kernels are planted in each hill, care being taken that they are not all thrown together, but separated a few inches apart, and covered with nothing but mellow dirt, one and a half inches deep. The usual time of planting is about the tenth of May. As soon as planted, a thread of common wool twine is stretched about the field, upon stakes firmly fixed in the ground, at about six feet from the ground, to notify the crows that they have neither part nor lot in the crop. When the corn first makes its appearance above ground, a tablespoon full of common wood ashes is put upon each hill. As soon as the rows are plainly seen, (or when the corn is about two inches high,) it is cultivated both ways of the field, and hoed, care being taken that the grass is perfectly cut up, and the dirt loosened around the stalks of corn. When the first hoeing is completed, it is plastered with about a teaspoon full of plaster to each hill.

In about two weeks from the first hoeing, and *before* it *needs* it, it is cultivated and hoed again. In two or three weeks more it is cultivated and hoed the third and last time, and plastered as after the first hoeing. No further culture.

When it has generally began to glaze, it is cut up by the roots, and set up in stooks, containing about twenty-five hills each. As soon as sufficiently dry it is husked in the field, the corn drawn home and cribbed, and the stalks bound and if well cured put immediately under cover.

In selecting seed corn ears are selected which are perfect in all respect, and well kernelled over the small end; the imperfect kernels from each end

Digitized by Google

of the ear removed, and the remainder shelled for seed. I have been thus particular in relating my manner of growing corn, because I consider it as one of the most important crops grown upon the farm. If I had leisure I should like to give my views in relation to the uses of a corn crop. The average product of corn is from seventy to one hundred bushels per acre.

Potatoes are cultivated as corn, planted the same distance apart, and receive the same treatment, and usually produce from three hundred to three hundred and fifty bushels per acre.

Carrots and Beets are grown upon similarly prepared ground, in drills, eighteen inches apart, average growth of beets, (blood and sugar varieties) four hundred bushels, and carrots eight hundred and fifty bushels per acre.

Barley, Oats and Peas are sown upon corn stubble plowed from eight to ten inches deep. Three bushels of seed are sown per acre for the above crops, about the middle of April. Barley and oats are cut when the quantity of milk in the kernel has begun to diminish, bound in small sheaves and put in stooks to dry. Hauled in when well cured, and thrashed with machine, and the straw housed for feeding. Peas are hooked up with a scythe, secured when dry, thrashed with a hand flail, and the straw housed for feeding. The average of our barley crop is from forty-five to fifty bushels, of oats from seventy to ninety. Peas have not been cultivated until the present season; the yield from one acre this season was forty-one bushels, thirty-one pounds, allowing sixty pounds per bushel. When practicable, the ground for barley, oats and peas, is subsoiled to the depth of fourteen to sixteen inches.

Wheat is sown upon barley, oat and pea stubble, plowed once, from eight to ten inches deep. Two bushels of wheat is sown per acre, the first week in September, cut as soon as out of milk, bound small and set up in shocks to dry. Thrashed with machine, and the straw housed, or as much as possible. I would here remark, that room has been provided for storing the straw of from ten to fifteen hundred bushels of grain; that I consider straw and chaff where the grain is cut before ripe, and well secured, as highly nutritious and valuable, and I cannot afford to suffer the loss necessarily incurred in stacking all my straw. Average wheat, twenty-eight bushels per acre.

Small red clover and Herds grass seed are sown upon the wheat, the latter in the fall, and the former in the spring, the fall after the wheat is cut it is pastured but little; plastered early the following spring with about one hundred pounds per acre, and cut when in full bloom, cured in the heap, and housed for feeding. The second growth is allowed to ripen for seed, and cut and

Digitized by Google

secured in September. The same course is pursued the following year: and the third year it is pastured, and the following spring manured and planted. Average amount of grass cut per acre, from one and a half to two tons, Average clover seed, three to four bushels.

Insects have not materially injured my crops. The wire-worm and grub have in some instances attacked my corn, and have been diligently hunted and killed.

I have never made an estimate of the amount of fertilizing matter taken from the soil by an acre of grain. I should look with confidence to a correct analysis of the grains as determining this point. Upon this subject I have read with the greatest interest Prof. Emmons' second volume on Agriculture, in which volume the Prof. has, in my humble opinion, done more for the farmers of New-York, than he would have done, had he discovered for them in the center of the State, an inexaustible mine of gold. I consider good soil, judiciously managed, as the very best "diggins" in the world.

15 & 16. See above.

17. My potatoes have been seriously injured by the "potato rot," but I have looked and read in vain for cause or cure. My potatoes when dug are spread in outdoor rooms, and not carried to the cellar until cold weather. They are often sorted over and kept as dry as possible, which I consider the best treatment for their "complaints."

GRASS LANDS, &c.

18. Timothy and small red clover are the only kinds of grass sown. About six quarts of clover seed are sown broadcast in the spring, and three quarts of timothy in the fall, per acre. Red-top grows spontaneously on some low meadow, and is esteemed for cattle.

19. About fifteen acres are mown for hay, and the average product about one and a half to two tons per acre. Grass is cut when in full flower, and cured in the heap, as above.

20. I have four acres unsuitable for the plow, and is kept in condition by an occasional top-dressing in the fall, of well rotted manure.

21. Have never practiced irrigating.

22. Have not redeemed low, bog, or peat lands.

23. Burdocks and Canada thistles have been the most troublesome weeds on the farm; the former are best eradicated by cutting below the crown with a grub-hoe, which needs to be done before flowering. Canada thistles have been killed by repeated plowing. Hoeing has also been successful in eradicating them. Thistles that grow upon broken land where they cannot be tilled, are mown before going to seed. All weeds along the line of

Digitized by Google

fences, and near buildings, should be cut before the first of July, and once in every month of the season thereafter. Elder bushes need the greatest diligence to overcome, and should be hunted to the last extremity. Several patches along the line of fences have been destroyed by frequent grubbing and pulling up all roots.

DOMESTIC ANIMALS.

24. I have no oxen at present. There are upon the farm one three years old heifer, of the Devon breed; two two years old heifers, of the common variety; four calves; three two years old steers, fattening, and one two years old bull. We have four horses.

25. Have made no experiment to ascertain the relative value of different breeds of cattle. The short horns would be preferred for the butcher, on account of their early maturity.

26. My cattle are wintered in warm yards, supplied with ample sheds, which are kept well littered. The yards are supplied with clear spring water, which is conveyed in lead pipes some eighty rods, from a water ram. Stalls are provided, with gates closing upon each animal as he enters, supplied with ample mangers, so constructed as not to allow any food to be wasted. Into these stalls the cattle are run twice each day, and fed with cut straw, cornstalks, and hay and meal. As soon as they have eaten their supply they are turned out, and remain in the yards. I consider it highly important that cattle should be kept thriving, and not allowed to grow poor during winter. And this remark may equally well apply to all farm stock.

27. The products of the small dairy kept upon the farm are all consumed in the house, and have never been valued. I do not consider it profitable at present to produce butter or cheese for market.

28. I have two hundred and three sheep, consisting of one hundred and seventy fine wooled ewes, seventeen fine wooled wethers, seven fine bucks, and eight ewes and one buck, thorough bred South Downs. My fine wooled sheep are a cross of the Merino with Saxon; sheared last season a little over three pounds per head of clean, white wool, which I sold for forty-two cents per pound. My ewes generally produce lambs, of which about nine-tenths are usually raised. My lambs in the fall, in good condition, are worth one dollar; fat wethers, sixteen to eighteen shillings.

29. My sheep are all furnished with warm sheds, and yards sheltered from the wind and storms, by buildings and high fences. Are supplied with clear water, (which I consider highly important,) and are fed upon straw, hay and grain. Very seldom loose a sheep in winter.

I have but recently owned coarse wooled sheep, and cannot draw any comparison between them and fine wooled ones for hardiness. From the

Digitized by Google

build of the South Down, and the avidity with which they eat straw and hay, I should judge them hardier than fine wooled sheep.

30. I have six hogs fattening, and twelve pigs from three to six months old; all full or part blood Leicestershire. Feed pigs until one year old with slop from the house, and a little bran or meal, together with refuse apples, roots and pumpkins. At one year old the food is improved in quality, but gradually lessened in quantity, as I feed fattening hogs but little slop or water. My hogs are principally fattened upon corn. I prefer it ground fine, mixed with one-fourth its bulk of bran, or the meal of some light grain, as oats, and scalded. My hogs are butchered at fifteen or eighteen months old, and weigh from three hundred to three hundred and fifty, well fattened.

31. I have made no accurate experiments in feeding roots and grains for the purpose of testing their comparative value. Such experiments *should* be instituted, and farmers I am aware, are the ones upon whom this business devolves. I esteem roots for feeding milch cows, to feed with meal for fattening cattle, and for occasional feeding to sheep. If roots contained no nutriment, (which they do to a *considerable* extent,) their effect upon the animal system is such, keeping the system in a thriving, healthy condition, that they should be grown and consumed upon every farm.

FRUIT.

32. There are one hundred and twelve apple trees upon my arm, mostly grafted; twenty Northern spys, (one of which, a tree about eight inches in diameter, bore the last season twenty-three bushels of large, fine apples;) fourteen English russets; ten Greenings; some half dozen Esopus spitzenburgh, and several trees of Belle bon, Jersey apple, Fall pippin, Early bough, River's golden sweet, Twenty ounce apple, &c. Many of my trees have been grafted the past season, and are doing finely.

33. I have one hundred and twenty fruit trees besides apples, consisting of plums, pears, cherries, peaches, apricots, &c. The following are among the best of each variety: Plums—Bolmor's Washington, Yellow egg, Imperial gage, Green gage, and large sweet Blue. Pears—Vergalieu, Bartlett, Andrew's, and Bell. Cherries—Black Tartarian, Black eagle, Ox hearts, May bigarreau, and White bigarreau. Apricots—Black and Early yellow. Peach—Some eight varieties. Quince—Portugal.

Currants, gooseberries, raspberries, strawberries, and grapes are also cultivated.

34. Slugs have in some instances attacked the leaves of cherry trees, and are destroyed by sprinkling ashes upon them when the dew is on.

Caterpillars are hunted with diligence, and destroyed as early as possible.

Digitized by Google

35. The earth around fruit trees is kept mellow, and enriched with well rotted manure. The bark is scraped and washed with soap suds, to keep it smooth and healthy. Pruning is performed annually, in the winter.

36. Fowls are considered not an unimportant part of the farm stock, and accurate experiments have been instituted for the purpose of determining which variety is the most profitable. In these experiments regard has been had to the kind and cost of food consumed, and the actual return in eggs and chickens. Thinking that the particulars of one of these experiments may not be altogether uninteresting to you, I take the liberty to give it in detail. It is as follows:

The latter part of February of the current year, (1850,) I built a poultry house, which was thirty-one feet long by thirteen feet wide, attached to a horse barn at one end, and a shed at one side. The roof was made of boards, and battened; had two windows for the admission of light; was furnished with the necessary feeding hoppers, watering trough, boxes for laying, roosts, &c.

The first day of March it was filled with eighty fowls of the common variety, mostly pullets one year old, which I procured at an average expense of 18¾ cents.

They were regularly fed with corn and oats every morning, supplied with water, gravel, lime, and fresh meat, boiled tender, and usually chopped fine. Let out to roam every afternoon.

An accurate account was kept of the expense of building the poultry house, the cost of the fowls, the amount of grain consumed, and the number of eggs obtained, which was as follows:

Lumber and nails for building,	$10 90
Labor of building, four and one-half days, at $1,	4 50
Eighty fowls, at 18¾ cents each,	15 00
Ten bushels corn, at fifty cents,	5 00
Nine bushels oats, at 33⅓ cents,	3 00
Making the amount of expense,	$38 40

In ninety days they furnished me 385 dozen and ten eggs, which, at ten cents per dozen, were worth $38.58, being a trifle more than the cost of building the house, the fowls, and the grain consumed.

Where but one variety of fowl was to be kept, and that kind was to furnish the family with eggs and chickens for the table, I should prefer the Dorkings, on account of their large size, early maturity, and good disposition, and being very good layers. When eggs alone were demanded, and

Digitized by Google

the poultry house was situated near the dwelling where the fowls could be sheltered from the attacks of hawks, and other injuries, I should prefer the Black Polands, as I think them the most prolific layers among the feathered tribe. Young fowls, of whatever description, I have found to produce more eggs than old ones.

BUILDINGS, &c.

37. My buildings are sixteen in number, and consist of a dwelling house, wood house, well house, smoke house, boiling house, hog house, workshop, three large roomy sheds, horse barn, two grain barns, and three hay barns with sheds attached. My dwelling house is thirty by forty feet with a kitchen attached eighteen by twenty feet. In the center of the front of the house is a hall nine feet wide, on the left hand a parlor fifteen and a half by sixteen, and on the right a laboratory fifteen and a half by sixteen, back of the parlor a bedroom nine by fourteen, a dining room fourteen by twenty-two, a buttery nine by eight, and a clothes room five by six feet. There are two chambers the size of the parlor and laboratory, a hall between, and four bedrooms of good size and convenient, above. The garret is ceiled up and is a commodious store room twelve by forty. There is a good cellar under the main building thirty by forty feet, seven feet high, and divided by brick partitions into three rooms. The house is painted white; green window blinds. My wood house is twelve feet from the kitchen door, (just twelve feet too far,) has a wood room fourteen by twenty and an aisle leading to the privy, a store room eight by fourteen feet below, above is a store room fourteen by twenty and a bathing room furnished with furnace and necessary apparatus for bathing, with a pump which draws water from a cistern under ground near the kitchen door.—(There is also a cistern under the kitchen.)

The well house is well built and furnished with a window and door and is painted white.

The smoke-house (also used for an ash-house,) stands in the extreme corner of the door-yard and is built of stone.

The boiling house is twelve by twenty-four. Has a room in one end twelve feet square, in which are set two kettles in brick for b iling food for hogs; also, used for making soap, &c.; and in the other end a room twelve feet square, with a small yard attached used as a poultry house.

The hog house is twelve by twenty-two feet. Is divided below into four rooms for swine, with a passage way between, above is a room twelve by twenty-two, for storing corn.

The work-shop has one tight room twelve feet square for wool; a carriage room twelve by fourteen, and a tool and work room twelve by twenty-six.

The sheds are well built, having a closed loft for hay, and the lower part

Digitized by Google

closed upon three sides, and used for sheltering stock. Their respective sizes are as follows: No. 1, is twelve by twenty-eight, has a store room in one end, eight by twelve. No. 2, is twenty by thirty-one, and has a poultry house in the rear thirteen by thirty-one. No. 3, is twenty-six by forty and has a plaster room in one end.

The horse barn is twenty-six by twenty-eight, has five good stalls, bins, capable of holding three hundred bushels of grain, a watering trough, and ample room for harness below, and a hay loft that will hold four tons of hay.

One of the grain barns is thirty feet by forty, has a bay one side of the floor, a granary and a stable on the other side. The stable is furnished with gates hung by standards, in front of the manger, in such manner as to let one of my cattle enter, when the gate is closed and fastened with a pin; then another enters, when another gate closes, and so all of them (six) are stabled in a moment.

The other grain barn is thirty feet by seventy, has a bay in one end thirteen feet by thirty, and in the other thirty feet by thirty. Has granaries capable of holding fifteen hundred bushels of grain. My three hay barns are each furnished upon one side with sheds sufficient for sheltering one hundred and fifty sheep. Two of the barns are capable of holding about twelve tons of hay, and have two doors, one above the other, at each end, for the convenience of filling and feeding out of. The third hay barn is capable of holding fifteen tons of hay, and has three doors at each end, one above the other.

38. There are upon the farm six and one-eighth miles of fence, mostly in good repair. There is three-fourths of a mile of board fence, made in the most substantial manner, mostly of pine boards and white cedar posts, well battened, five boards high. The door yard fence is made of two inch pine pickets, and cost from six to eight dollars per rod. The garden and fruit yard are protected from cold winds by high close board fences. The remainder of the fence upon the farm, about five and one-half miles, is worm rail fence, mostly of white cedar, and a few oak rails. About two miles of the rail fence has been re-built the past season, staked with perpendicular stakes, and capped with wire caps. (I use No. 10 or 11 wire.) A fence made of white cedar rails twelve feet long, laid with a six feet worm, staked with cedar stakes well put into the ground, and capped with a wire cap, I consider the most durable fence that can be made for the same money.

Strong farm gates are being substituted for bars, at all places where ingress is frequent. The cost of the board fence and rail fence upon the farm is nearly alike, and is not far from $1.25 per rod. I have not constructed any wire fence.

Digitized by Google

39. All grain grown upon the farm is measured or weighed. Hay is estimated either by the load or in the mow. *All* the products of the farm are estimated as nearly as possible, and all the operations upon the farm are minutely registered in the Farm Journal every evening.

40. A *Day Book* and *Ledger* is used, similar to those kept by the merchant, in which are entered all sales and purchases, and individual accounts are kept. The items from the Day Book are posted into the Ledger weekly. A part of the Day Book is devoted to cash accounts, and is balanced at the foot of every page.

A *Farm Journal* is kept, in which is written every evening the operations of the day, with such remarks and reflections as suggest themselves to the mind. To illustrate the nature of this journal more fully, I copy the following verbatim from the journal: "Thursday, June 20th, 1850. Finished shearing sheep, having sheared 314 sheep, on which we have expended fourteen days work shearing, and six days doing up wool and marking sheep. My sheep having been kept rather short during the month of March, are thinish in flesh, and have consequently sheared lightish fleeces; but the wool looks well, having been thoroughly washed and well done up.

My impression is that it is best to keep sheep in good flesh the year through, wash thoroughly and faithfully when the weather and water get warm, and not before, if it is not until the middle or 20th of June; turn into clean pastures after washing, and after sufficiently warm weather to dry the wool perfectly, to shear; having employed the very best help to be had, (and none others, although poor ones may be obtained at half price,) to take the greatest possible pains in doing up wool and putting it in a clean room, where every fleece can be seen to advantage, if possible. Wool thus treated cannot fail to command the highest market price, and do credit to the grower. I think it an excellent plan to tag sheep in the spring before turning out to grass, and would sell the tags separately from the wool, so as to leave the fleece nothing but clean, white wool, such as a manufacturer would like to buy, and such as any farmer would be glad to exhibit."

A *Farm Ledger* is kept, in which a debt and credit account is kept with every field on the farm, with all kinds of stock, and all experiments instituted during the year. The following copied from my farm ledger, will illustrate more fully its object and utility:

Digitized by Google

Three Western Steers.	DR.
Dec. 1st, 1849. To cost,	$60 00
May 25th, 1850. To straw and stalks at 2*s.* per head per week, 23 weeks,	17 25
To 80½ bushels ears corn, at 2*s.*,	20 13
To interest on cost since Dec. 1st,	2 01
Amount of cost,	$99 39
	CR.
By 12 loads manure, at 4 shillings,	$6 00
Cash amount of sales,	96 00
Amount received,	102 00

Leaving a balance in favor of the operation of $2.61.

A *Stock Register* is kept, in which is written the description, condition, and age of the farm stock. The sheep upon the farm are all numbered, and the numbers entered in the stock register, and opposite the number, the sex and age of each sheep, together with the quality and quantity of the fleece, condition as to flesh, and observations. When any disease appears among the farm stock, its appearance, treatment and results are here registered, and thus preserved for future reference.

A *Fruit Register* is also kept, and each fruit tree upon the farm, of whatever description, is labeled with a tin label, affixed to the tree, if the tree is small, by means of a wire passing through the label and around the limb of the tree; or if the tree is large, as in the case of orchard apple trees, a small shingle nail is put through the hole, and tacked into the tree. The number of each tree is placed in the register, the year when planted set opposite, and annexed is the variety of fruit, its flavor, abundance, &c. If insect or disease attack a tree, it is here noted, the treatment adopted, and results. If a tree is barren, means are taken to restore it to fertility, and the corresponding success.

In addition to the above, a *Meteorological Journal and Note Book* is kept, in which are regularly registered at morning, noon and night, the temperature, the elevation or depression of the barometer, the direction of the wind, and such observations as are of interest.

The writer is aware that many individuals will consider this system of accounts as too voluminous. But if any system of accounts is beneficial, then that system which attains its object most perfectly is the *most* beneficial. A few minutes, or half an hour spent each evening in noting the employment of the day, and such other matters as are of interest, would render

Digitized by Google

the farm journal an interesting reference book. And if any one will keep one but for one year, I will guarantee that they will not willingly discontinue the practice.

41. The receipts upon my farm for the year ending December 1st, 1850, were as follows:

827 lbs. wool, sold at 42 cts. and 23 lbs. coarse do., at 32 cts.,	$354 70
57 lambs sold early, at 7s.,	49 88
145 cullings and young wethers sold for	172 63
310 bushels wheat at 8s, 3d.,	319 30
106 bushels barley sold at 58 cents,	61 48
263 bushels oats at 33 1-3 cents,	87 00
41½ bushels peas at 75 cents,	31 13
1100 bushels ears of corn at 2s.,	275 00
200 bushels potatoes at 2s.	50 00
Apples sold,	10 00
43 loads pumpkins at 8s.,	43 00
30 tons hay, secured in fine order, worth $8,	240 00
24 tons straw valued at $3.00,	72 00
18 tons corn stalks at $3.00,	54 00
Quarried lime stone sold for building,	24 00
Growth of swine sold	20 00
Growth of four calves valued at $18,	18 00
Growth on three steers since July 1st, valued at $12,	12 00
Growth of three heifers and bull, valued at $18,	18 00
Received for use of bull and boar,	28 00
Value of clover seed grown,	28 00
Sold three pelts at 6s.,	2 25
Cedar timber sold from swamp,	620 00
Fire wood sold,	80 00
Timber for building sold,	32 00
Amount of receipts from farm,	$2,702 37

The expenses of my farm operations the same year were as follows:

Paid for hired help,	335 00
Time of self valued at $300,	300 00
Blacksmith's bill,	15 50
Taxes on farm,	17 00
Interest on farm at $7,500,	525 00
Wear of team and tools,	50 00
Amount of expenses,	$1,242 50

Digitized by Google

Leaving a balance in favor of the years operations of $1,459.87, equal to $9.73 per acre after paying interest and taxes.

I intended to accompany the above statement with a plot of my farm and construction and situation of my buildings, but a deep snow which has just fallen renders it impracticable at present.

I have thus concluded a statement of my farm operations, which I submit with great reluctance, knowing that it is imperfect in many respects. But if my imperfections shall awaken in any one a disposition to excel in the great science and art of agriculture, my highest ambition will have been gratified, and I shall feel amply rewarded for penning this hasty sketch.

In reference to the care and management of farm stock, I would add, that in my opinion, a farmer ought never to allow an animal to grow poor upon his hands. That all farm stock should be kept thriving; and that when any animal deteriorates in value, it does so at the expense of its owner. In selecting stock for breeding, care is taken that the animal be in the prime of life, neither too young or too old, and by no means unhealthy or diseased. The greatest possible care is also taken in selecting seed of all kinds for the farm; believing as a general rule that like begets like.

I *subscribe* for, and *read*, six agricultural papers, which I consider the best investment made in the year.

ONTARIO COUNTY, *ss.*—Elisha M. Bradley, being duly sworn, says that the statements set forth in the description and management of his farm, which he has styled the "Cypress Farm," and to which statement he has subscribed himself "Acacia," are true in all respects, to the best of his knowledge and belief. ELISHA M. BRADLEY.

Subscribed and sworn before me, the 28th day of December, 1850, at East Bloomfield, N. Y.

ISAAC W. MITCHELL, *Justice of the Peace.*

Digitized by Google

COUNTY SOCIETIES.

THE reports from the County Associations possess unusual interest the present year. The increased attention which is manifested in the subject of agricultural improvement throughout the State, has had the effect to add largely to the interest of these Associations. The numbers in attendance upon the public exhibitions have been much larger than heretofore, and the addition of new members in most of the counties is among the cheering evidences that the results of the efforts of these Associations are appreciated among the intelligent farmers and mechanics throughout the State.

The Corresponding Secretary, in accordance with the directions of the Society, has visited as many of the County Societies as was practicable, and the intercourse between the State and County Associations has been in the highest degree interesting and useful. He has been received with the utmost cordiality, wherever he has attended, and has received assurances that his labors have been beneficial to the Societies he has visited. Every year renders it more and more evident, that this intercourse should be continued, and as many Societies as practicable should be visited every year. The objects and views of the State Society are thus made known—the official organ of the State Society has by this means also an opportunity of learning the true state of the agricultural interest in the counties which he visits, and has an opportunity of advising and conversing with the officers of the Societies, as to measures best calculated to promote their interests far more effectively than can be done in any other manner. It is gratifying to be assured, as the Society is, that these services are appreciated—the calls for the labors of the Secretary, for the ensuing year, already numbering more Societies than he will probably be able to visit, unless some arrangements as to meetings are made with special reference to that object.

The great desire manifest among farmers, in different sections of the State, to become familiar with the best means to improve their husbandry—to learn what the investigations of science has done for them—is most cheering. But one voice, among the best farmers, has been heard on the subject

Digitized by Google

of a school for the agricultural class, and that has been in its favor. Farmers are beginning to realize the unspeakable importance of receiving all the aids which can be given them, and they cannot doubt that if all the other professions have been prospered and advanced by right directed education, they too may, in like manner, receive equal benefit from an education adapted to their profession. It is to be hoped that this united desire, on this all-important subject, will lead to the establishment of an agricultural college and experimental farm, by the Legislature, and thus afford an opportunity long desired, to test, by experiments carefully carried out by competent men, the best methods of improving our husbandry, while an education is at the same time secured to the farming interest, that will, for all time to come, conduce to the best interests of the State and of the Union.

From several of the counties, samples of grain have been forwarded to the Agricultural Rooms, to be arranged in the Museum of the Society, for future reference. It is expected that this will be continued, until every county in the State shall be represented; and as improvements in agriculture advance, and additional collections are made, the evidence will be afforded to all, as to the improvements which are made. The Executive Committee desire to call the attention of the officers of County Societies to this subject. In every town some efficient man could be secured, to obtain samples of grain, and an account of the soil where it grows, and the varieties best adapted to culture. By doing this, an increased interest would be secured in the different counties, and all would eventually be benefited by the valuable information which would be secured. The rooms of the Society are not at present sufficiently extensive to provide suitable accommodations for these collections; but it is not doubted that the Legislature will make provision for the purpose. The interest which is manifested by the citizens of the State in the collection of implements, seeds, models, &c., already made, gives assurance that nothing will be wanting on the part of the Legislature, to make such additions to the present accommodations as shall be adequate in all respects to the proper arrangement and exhibition of the articles, interesting and useful to the farmer and to the citizen of the State, and in every respect worthy of the State.

ALLEGANY.

The Allegany County Agricultural Society submit the following statement of their proceedings during the past year:

We feel no small degree of gratification in being able to report a decided improvement in the affairs of the Society. It is believed that much of the indifference and prejudice existing among the farming class of community is

Digitized by Google

fast receding, yet many of our farmers appear to be indifferent on the subject, so much so that we frequently apply for assistance, (and with far more success,) to those who are not immediately engaged in the cultivation of the soil. At least one-third of the members are composed of merchants, mechanics, &c. This should cause a blush on the cheek of every intelligent farmer—yet we are confident that the Society has never been so well united in the promotion of the objects for which it was organized as at present. There has been an increase of about fifty members to the Society for the past year, over former years, and we hope the number will be increased the coming year.

The fair was held at Angelica, on the 17th and 18th days of September, and was numerously attended by persons from all parts of the county. The first day was mostly devoted to the examination of the various kinds of stock. The display of horses, both matched and single, also mares and colts, was, it is believed, highly satisfactory to all present. The number of cattle on the ground was something less than on some former years, and it was thought they were inferior to those exhibited on some former occasions; however, there were some very fine animals offered, to which premiums were granted. In sheep, the number was less than on some former years, yet the offering was very good. One Pauler Merino buck, one year old, with his fleece weighing thirteen pounds, owned by David R. Stillman, of Alfred, was much admired. There was also some swine on the ground. The number was small, but the quality was good. The samples of butter and cheese were first rate, and it is confidently believed would not suffer in comparison with that produced in any county in the State.

The display of domestic manufactures was highly creditable to the fair hands that produced them. The show of fruits and vegetables was very good. A lot of forty-two different varieties of apples presented by Mr. Howe, of Almond, were much admired. Mr. Howe also presented a squash weighing fifty-two pounds. One was also presented by Mr. Angel, of Angelica, weighing seventy-one pounds.

The second day was devoted to the plowing match. There were but three competitors entered for the premiums. The plowing was all well done. The first premium was awarded to John Wm. McCombs, of Angelica —used Burrall's shell wheel plow. There was much interest and good feeling manifested in the plowing match, and we consider it as being the best part of our annual fairs. After the plowing match the annual election of officers was held.

In closing the fair an address was delivered by the Hon. Martin Grover, which was attentively heard by all present.

Digitized by Google

It is believed the fair closed with as much, if not more good feeling, than on any former occasion; and we think every one felt determined to use their best exertions to make every ensuing fair more useful and interesting.

The officers elected for the ensuing year are the following: James Wilson, Jr., President; Charles Benjamin, Samuel Townsend, E. B. Winans, Joseph T. Lampson, David R. Stillman, Robert Renwick, Vice Presidents; Ezra Starr, Secretary; James Lockhart, Corresponding Secretary and Treasurer; D. M. Clark, S. S. Buckley, Samuel Sherman, J. W. McCombs, Andrew Rutherford, Andrews Post, Ja's Simons, Wm. Howe, John Powers, and Joel Karr, Directors.

The committee on field crops met on the 26th November, and we are sorry to say that there was no applicants for premiums. This cannot be on account of light crops, for the crops in this county the past season were very good. We hear of crops of wheat averaging from twenty to thirty bushels per acre without extra cultivation. The crops of oats and corn were never better, probably averaging from thirty to eighty bushels per acre. Barley lighter than usual; from twenty to thirty bushels per acre. The hay crop from one-half to two tons per acre. The potato crop was very light, and of poor quality.

The receipts and expenditures of our society the present year are as follows:

Amount in treasury from last year,.....		$182 21
Received of members,.....		120 00
do State treasurer,.....		93 00
do A. Morse, interest,.....		10 50
		$405 71
Paid in premiums,.....	$155 25	
do incidental expenses, ...	8 70	
		163 95
Balance in treasury,.....		$241 76

JAMES WILSON, JR., *President.*

The *Pine Apple* and *Shipping Cheese*, by Robert Norton of Rushford, is a new article which has been introduced in the dairy business in this county, which promises well.

Mr. N. is from Goshen, Ct., where he was extensively engaged in the manufacture of this article, known the world over as the "Norton Pine Apple Cheese," But the opening of the Erie railroad induced a removal

Digitized by Google

of his location to Allegany county. His establishment is supplied with curd from the neighboring dairies, for which he pays five and a quarter cents per pound, weighed when taken from his presses in the form of green cheese. His curd is kept until its age brings it into the same chemical state that is produced by a thorough scald, after which, it is cut up into pieces one inch long and three-eighths of an inch square, by a machine which works up twenty pounds per minute. After this it is warmed by water at 90° and salted at the rate of one pound of salt to forty pounds of curd.

The Pine Apple Cheese are first pressed smooth with a neck projecting from the lower end, to which the pressure is applied. The impression is made by a net, which is stretched on by a screen, after softening the cheese in hot water. This toughens the rind and insures the cheese a safe arrival after a long voyage. The Norton cheese are in very great demand by California shippers. The shipping cheese weigh about ten pounds, and are pressed in tin hoops, in perpendicular columns, containing one cheese each. Mr. N. makes forty pine apple and from ten to twenty-five shipping cheese daily.

Town Association.

An Agricultural association was organized in Centerville, in this county, April 6th, 1850, composed of citizens of Centerville and Hume. Officers, William Weaver, President; Delanson Pratt, Vice President; Benjamin Wight, Secretary; Russell Higgins, Treasurer.

The object of the association is to endeavor to excite an interest on the subject of agriculture and the mechanic arts, to diffuse mutual instruction among its members, and to use all suitable means to elevate the ancient and honorable calling of the farmer.

(It is most gratifying to notice the spirit which is aroused throughout the State—and we are pleased to notice the organization of town associations among farmers for mutual improvement. Wherever they have been instituted, a new impulse has been given to the cause of agriculture, and there can be no doubt that great good will be the result, wherever they are properly organized and sustained. As a means of increasing their influence and usefulness, we would suggest that careful surveys of the towns should be undertaken, and a complete account of the crops and productions of each town should be annually made, and returned to the State Society. In this manner, every association would in a few years embody a mass of facts, that would be of great importance to themselves as well as to the agricultural interest generally.)

Digitized by Google

CHAUTAUQUE.

The annual Fair was held at Jamestown on the 18th and 19th of September, and was very numerously attended. The show of cattle was extensive and comprised many fine specimens. In horses there was less competition, but those entered were very superior animals, and would compare favorably with any previous exhibitions. The show of miscellaneous articles was the largest exhibited since the organization of the society.

In the dairy department the exhibition was not as large as might have been expected, from a county whose reputation is as high as that of Chautauque. The quality, however, of that on exhibition could not be surpassed.

The increasing interest of the inhabitants in the enterprise, is evinced by the large number this year in attendance, and the increased receipts of the society, they being about $200 more than last year. The encouragement for still further effort to elevate the character of the various industrial pursuits in the county is good, and it is hoped that those who have so perseveringly labored for this end, will not relax, but that renewed efforts will carry forward the work to a successful and triumphant result.

On the second day of the Fair a very excellent address was delivered by the Hon. Madison Burnel, of Jamestown, which was well received, and published in the papers of the county.

HENRY BAKER, *President.*

The officers for the ensuing year.—For President—Daniel Williams of Harmony.

For Vice Presidents—John H. Pray, Harmony, John E. Griswold, Sheridan; A. F. Morrison, Hanover; Austin Pierce, Villenova; Harry James, Cherry Creek; D. H. Treadway, Ellington; William Wilcox, Arkwright; John M. Edson, Charlotte; William Vorce, Ellery; B. W. Field, Gerry; William Risley, Pomfret; Timothy Judson, Portland; E. C. Bliss, Westfield; C. O. Daughaday, Ripley; Nelson Van Ness, Chautauque; Otis Skinner, Sherman; Gideon Barlow, Mina; Lyman Brown, Clymer; Silas Terry, French Creek; Amos Fuller, Poland; John Stow, Ellicott; Reuben E. Fenton, Carroll; Orren Stoddard, Busti; Chauncey Warren, Stockton.

For Secretary—W. L. Sessions, of Panama.

For Treasurer—John Steward, of Panama.

Report of the Committee on Sheep.

It is with a pleasurable gratification that the committee on sheep are enabled to report to your Society that the exhibition of this useful animal at this your Annual Fair, was in every way creditable to the county, whose

Digitized by Google

wool-growing interests they represent in all that appertains to fine wool sheep while that of coarse wool sheep was, they are sorry to say, meagre in the extreme. And your committee are of the opinion that if coarse wool sheep are to continue the recipients of the bounty of your Society a just appreciation of the generous intentions of such bounty should induce individuals presenting such specimens for exhibition and competition to produce better ones than those submitted to the inspection of your committee this day. The coarse wool sheep is a useful animal in its proper place and sphere. In an agricultural point of view, its most useful qualities are its fattening properties, and in this view farmers should learn that it is more for their interest to rear an animal that will weigh from forty to fifty pounds per quarter rather than one that will not weigh half of it. Your committee are pleased to notice that the suggestions of former committees of your Society have been heeded by the farmers growing fine wool sheep and that they have evidently learned that the quantity of wool which such sheep will yield, is quite as important a matter and equally susceptible of improvement as its quality.

CHEMUNG.

The Hon. E. C. Frost, Vice-President of the State Society for 1850, in answer to a letter from the Secretary, says:

In answer to your inquiry in relation to a report from our Agricultural Society, I regret to say, we have none. In consequence of the neglect of the officers of our County Agricultural Society to make the required report, the Comptroller, in 1849, refused to pay over the State bounty. The treasurer having moved west, it was impossible to procure the necessary papers to repair the deficiency—hence, it was thought best to dissolve the association and re-organize, so as to get clear of that embarrassment in future Certain persons were instructed to call a meeting, to re-organize, on a certain day, but omitted to publish it until after the time had expired, which left us without any organization during the last year.

I have within a few days procured names to attach to a call for a meeting to re-organize, and I trust next fall will find us with a county organisation in full blast.

This temporary deficiency has not been caused by any lack of interest. want of disposition or desire on the part of the agricultural interest of the county to sustain an efficient Agricultural Society.

For eight years in succession we held exhibitions that were very creditable to the county, as a beginning; and a disposition to attend such fairs is

Digitized by Google

now much more general than at any previous time. In the way of stock, implements, horticultural products, and in all other respects, we now have the means to excel all our former displays.

Little Chemung is perhaps now improving in value as fast as any county in the State, and I hardly think any can be found better if as well provided with railroads and canals as this. A railroad passes through every town in the county but two, and the canal or navigable feeder does the same, or joins all but three. The New-York and Erie Railroad passes through it from east to west, which is destined to be the greatest thoroughfare in the United States. The Chemung road passes through the county from north to south, which must be the route from Lake Ontario to Washington city; one diverges northwestwardly from the north side of the county by the Canandaigua road, and north by the Seneca Lake, which never freezes, but is traversed by steamboats during the whole winter. From the south side of the county, leading from Elmira, a road is now let to Williamsport, in Pa. From the west border of the county, in addition to the Erie road to Dunkirk, the Blossburgh road branches off in a southwestwardly direction in Pa., and the Cohocton Valley road northwestwardly to Batavia, which is now under contract; while from its eastern edge the Erie road leads to New-York city, and the Pennsylvania canal down the north branch of the Susquehannah to Philadelphia. Each of these Pennsylvania improvements lead directly to the iron and coal of that State on the south; and those leading north, both canal and railroad, to the plaster and salt of our own State.

After seeing all these advantages, which this county must possess, for agricultural and manufacturing purposes, you will be better prepared to credit the assertion, when I say that farming lands have advanced in price within the last two years, from twenty-five to thirty-three per cent., and is still improving.

Our fat cattle, sheep and swine, are no longer driven out to market, but are transported without delay by the Erie Railroad. Instead of floating our produce across the State to the Hudson, only in summer, we are now within ten or twelve hours of New-York city, the produce and money market of the United States, the whole year round.

The river flats along the Chemung will, it is believed, produce as much corn per acre as any land in the State. The most of the county is well adapted to the production of grass, wheat, and oats; and we have dairies which can vie, as to quantity, quality, and price, with old Orange itself.

The northern part of the county is most admirably adapted to the growing of fruit. The atmosphere along the borders of the Seneca Lake is

Digitized by Google

much ameliorated by the warm breezes rising from it during winter and spring, which is a sure protection to the fruit buds, of the most tender kinds.

Very respectfully,

E. C. FROST.

CHENANGO.

The Annual Fair of the Chenango Agricultural Society was held at Sherburn, on the 17th and 18th of September, and was numerously attended by the most intelligent and successful farmers of the county, and the collection of citizens to witness this, "The Farmers' Jubilee," was very large, and much interest was manifested in the prosperity of the Society.

The land in this county is peculiarly adapted to grazing, although the beautiful valley bearing its name, and running through the center of the county north and south, produces as large crops of grain, particularly corn, as any lands in the State.

But the principal productions of the county are butter, cheese and cattle. There are many large dairies in the county, ranging from twenty-five to ninety cows each. This branch of farming is increasing rapidly, and there is, perhaps, no county in the State that sends as much butter and cheese to market as this, in proportion to the number of acres of improved land. The surplus are being converted into lumber, which meets with a ready sale, and is sent to eastern markets on our canal. The numerous plank roads in operation, and now building, have awakened the dormant energies of those, who have heretofore had to encounter bad roads to get their products to market, and there is nothing that tends more to the agricultural improvement of a country, or the social condition of its inhabitants, than good roads. "Improvement" appears to be the "watchword" among our farmers, as their productions on each succeeding fair conclusively show. In cattle the exhibition was large and very fine. The Durhams presented by Whitman Wilcox, of Norwich, and Augustus Ross, of Preston; the Devons by J. Whiting, of Guilford, and the large number of cross and native breeds, were never surpassed at any previous Fair.

The growing of wool, which has for the last few years decreased in this county, is again beginning to excite the attention of our farmers, and a large number of the different breeds of sheep were on the ground, the most prominent of which were the Saxony, Merinos and South Downs. The Merinos appear to be most in favor, as it is thought they are capable of enduring the rigors of our northern climate better than any other breed, and their heavy fleeces better repay the grower than the finer, and consequently lighter wooled Saxons. Still there are some fine flocks of the latter,

Digitized by Google

which, on account of the high price obtained for the wool, are held in high repute.

The exhibition of butter, cheese, sugar and vegetables, as well as the product of the mechanic arts, was highly respectable, and last, though not least, the productions of the "needle and the loom," in great variety, were tastefully arranged by the ladies, and were the center of attraction the second day.

The address was delivered by B. P. Johnson, Esq., the able Secretary of the State Society, and was listened to by a large and respectable audience, with much apparent pleasure and profit.

After the address the premiums were awarded, and the multitude dispersed to their respective homes, more than ever impressed with the utility of agricultural shows.

Age and weight of Mr. Wilcox's cattle:

1 pair four years old steers,.....	4,790 pounds.
1 five years old steer,.....	2,100 do
1 five years old heifer,.....	2,040 do

One pair of four years old steers, exhibited by Mr. Augustus Ross, and weighing 4,140 pounds, was very much admired.

The receipts and expenditures of the Society, the past year, are as follows:

Received from members, and admission fees,.....	$163 42
Voluntary subscriptions,.....	122 00
Received from the State,.....	122 00
Balance of 1849,.....	116 58
	$524 00
Paid out for premiums and expenses,.....	425 00
In treasury,.....	99 00

The annual meeting of the Society was held on the 7th January, 1851, and premiums awarded on field crops, as follows:

Peleg Pendleton, best acre of corn, 110 bushels.

Elijah Sexton, second best acre of corn, 95 bushels.

Geo. Davis, best acre of rye, 33 bushels.

Elijah Sexton, best acre of oats, 56 bushels, weighing 37 lbs.

S. L. Campbell, best acre of potatoes, 221 bushels.

Digitized by Google

Mr. Pendleton's Statement of Corn Crop.

The soil on which the crop was grown is a sandy loam, previously occupied as a meadow. Cearse manure was spread upon the land, at the rate of fifteen loads to the acre, and then turned under with the plow, ten inches deep. Well rotted manure was then spread upon the land, thirty loads to the acre. The ground was well harrowed and marked out in rows two feet ten inches apart each way. Planted the 11th of May, with eight and twelve rowed golden yellow corn, four kernels in a hill. About the 1st of June ashes were applied, and the missing hills were re-planted, the worms having destroyed a large number of them.

The corn was cultivated and hoed twice, and a small handful of a composition composed of plaster, ashes, and lime, was applied to each hill at the first hoeing, plaster only at the second. The corn was cut and stooked up the last of September.

The Society, at their annual meeting, appointed a meeting for the discussion of agricultural subjects, and in this way it is confidently anticipated that much useful information will be sown "broadcast" through our county, and return a rich reward in the increased productions of the agriculturist.

Officers for 1851.—President, J. W. Collins, of Smyrna; Secretary, James H. Smith, of Norwich; Treasurer, John Blinn, of Norwich; with seven vice-presidents, and one from each town in the county as an executive committee.

(Signed) AUGUSTUS SANFORD, *President.*

Norwich, January 1*st*, 1851.

CLINTON.

The Annual Fair of the Society was held at Keeseville, on the 25th and 26th of September, and was in many respects of a most interesting character. The exhibition of stock, dairy products, domestic articles, fruits, &c., was in the highest degree creditable to the county, and evinces an onward progress in the cause of agricultural improvement.

The competition in farm crops was less than usual, owing probably to the requirements of the Society, which require a clear and accurate report of every thing appertaining to the production of the crop offered for premium. Many of our farmers regret that they did not comply with the requirements and enter their crops, which would have been creditable to themselves and to the county. The crops in the county were generally good, and secured in good condition. Potatoes are the only exception, and as to them not general. In the north and west parts of the county, the disease has prevailed. There is a potato cultivated here, pale red, not exactly round,

Digitized by Google

called the "More potato," which has, it is believed, escaped the rot. It is generally believed, that good seed, planted in season, on unmanured new land, will not be likely to rot. I have planted the More, Pink eyes, English whites, and June potatoes, in separate lots, all on virgin soil, the sward turned over, and the rot has not affected them. As a general thing, the Pink eyes suffer more than any other variety grown in the county.

The influence of our Society is constantly increasing, and its effect upon the rising generation is evidently of a most favorable character. It excites a laudable ambition, begets a desire for more intelligence and information, and in various ways is productive of the most salutary results.

Annexed is a statement of field crops, and some interesting account of the manner of managing nurseries; a business which is very successfully prosecuted in this county. A new feature has been introduced in our premium list, for the encouragement of setting out shade trees. It has been quite successful, and will be productive of great good. A report in connection with the subject is submitted.

E. A. HURLBUT, *President.*

Officers for 1851.—At the annual meeting, Dec. 26, the following officers were elected: President, Jona. Battey, Keeseville; Vice Presidents, Z. C. Platt, Plattsburgh; A. J. Moses, Champlain; Anderson Keese, Keeseville; S. H. Moore, Peru; R. O. Barber, Beekmantown; Willets Keese, Peru; Silas M. Taylor, Schuyler's Falls; Alonzo D. Barber, Beekmantown; J. W. Bailey, Plattsburgh; Andrew Dunning, Chazy; Treasurer, Peter Keese, Keeseville; Secretary, Ira D. Knowles, Peru.

On motion, *Resolved*, That the thanks of the Society are due to E. A. Hurlbut, Esq., for the very able, impartial, and satisfactory manner in which, for the past three years, he has discharged the arduous duties of President of this Society; and that the Secretary be instructed to present him a copy of this resolution.

W. KEESE, *Secretary.*

Shade Trees.

J. Battey's statement relative to shade trees transplanted adjoining the highway near his residence, seventy-one in number:

The trees were all set in *sward* land—a place for each tree being prepared by opening a hole, four to six feet in diameter, according to the size of the tree, throwing out the soil as far down as to the subsoil, replacing the turf in an inverted position, and then filling up to nearly the level of the ground with good mould or soil from a highly cultivated field, which was manured and tilled the year previous, but without the addition of any manure this season; the tree then set on the bed prepared for it, the roots

Digitized by Google

extended in their natural position, the spaces nicely filled, and the roots covered to the depth of two or three inches, with soil of the same description. After the tree is thus planted, and securely tied to a stake, the surface is mulched by placing around it a wheelbarrow full of strawy manure. The tree is well headed back, so the loss of top shall nearly correspond with that of the root, and then left to take its chance pretty much as nature dictates. I seldom find it necessary or beneficial, when trees of any kind are thus planted and *well mulched*, to *water* them, even during the severest drought. In this case I did not use a pailfull of water on the trees after planting, yet every tree is alive except five, two of which were accidentally broken, and the remaining three died from the mulching having been accidentally *omitted*.

It will be noticed that my practice differs from the mode usually recommended in horticultural works, in two particulars; in *not* removing the subsoil, and in planting the tree two or three inches *higher*. I have become fully satisfied, both from analogy and experience, that in a retentive soil, the practice of digging a pit two or three feet deep for the tree to stand over or in, (unless it is provided with a *drain*,) must, however good the materials with which it is filled, prove, sooner or later, injurious to the health of the tree. It is evident that such a hole, or pit, filled with materials less compact than the surrounding subsoil, must, for the first year or two at least, serve as a reservoir into which the surplus water from the surrounding soil will be constantly settling, there to become stagnant, and as soon as the roots shall have penetrated deep enough, to cause them to canker, and thus destroy the health and vigor of the tree.

The evil consequences of planting trees *deeper* than they stood in the nursery, are pretty generally understood, and I have no doubt that in a very few years the superior advantages of planting them somewhat *higher*, will be a fact as well understood. For heavy soils, and indeed for all soils not quite light and porous, a very successful, if not the very best mode will be found to consist in placing the tree, after the ground has been well prepared by repeated and deep plowings, directly *upon* the surface, without digging any hole, and then filling in among the roots with good soil, to the same depth above them as they stood below the surface previous to transplanting. In this mode a sufficient quantity of soil must be added around the tree to render the surface nearly level for a distance of at least six or eight feet from it.

These remarks are not based upon mere theory. I have tested the mode by experiment with trees of several kinds, and in every instance with the most satisfactory results; and I have no hesitation in recommending it for trial on soils not actually quite light or dry.

Digitized by Google

Pear Trees, transplanted for bearing.

The trees were planted in ground which had been in cultivation for several years; no manure being applied this year, save what was applied as a top-dressing, in the form of the ordinary mulching which I give to all newly transplanted trees, and for which purpose I prefer horse manure mixed with about twice its bulk of litter, to any other. The mode of transplanting did not materially differ from that described as employed in the setting out of shade trees, except that very little excavation was made to admit the tree—no turf was used, and only the soil taken from the place where the tree was to stand, and from the immediate vicinity, was used in filling in among the roots. Those on free stocks were planted so as to stand when the soil should become settled, at about the same depth as in the nursery. Pears and quince bottoms I plant a little deeper, and then raise the earth about the tree high enough in all cases to cover the point of union between the stock and scion, at least one inch below the surface. In warmer latitudes this precaution is found necessary to save the tree from the attacks of the apple borer, to which the quince is also liable. Here this precaution is required for the additional reason of affording protection to the upper portion of the stock from the inclemency of our winters. Notwithstanding the extreme drought of the past season, and the entire want of any care in watering, every tree is now alive, and has made fair growth.

This mode of growing the pear, though of recent introduction in this county, has already become quite common, being esteemed, and very justly so, the best adapted of any to the *garden culture* of this fruit, as it enables the occupant of a very small garden to cultivate a sufficient number of varieties to furnish a succession through the entire season. And what will be regarded by many, who have been educated to believe that the planting of pear trees, like that of acorns, which are to become a forest, can only be done for the benefit of *future generations*—as a matter of greater consequence still, is the fact that when thus grown the Pear comes almost immediately into bearing. I this season had as fine specimens of the Surpasse Virgalieu as I ever saw, upon a tree scarcely three feet high, planted last year, and had it not been that the blossoms were all destroyed by that new enemy to the fruit culturist in this region, the "May Bug," I should have had fruit this year on upwards of forty trees, only one year from the transplanting, and but two and three years from the bud.

Of fifty-six trees on *Quince*, planted out this season, over *thirty* are now furnished with fruit buds, which is also the case with nearly every dwarf tree in the specimen grounds, which had been planted at an earlier period.

Blight of the Pear tree, so prevalent in various forms, in some parts of

Digitized by Google

the county, has never made its appearance in my grounds. The greatest enemy I have found to the successful culture of the pear, is the "slug," an insect closely allied to, if not identical with the "cherry slug." I find no difficulty in getting rid of them by the use of lime dusted over the trees, which should be done when the leaves are not wet. Even *fine dry earth* throwed by the hand with some force, will also use up all that it hits; and this, in the hands of careless cultivators, may be the safest remedy.

Union Nurseries, 11*th mo.*, (*Nov.*) 26, 1850.

COMPETITION BETWEEN CLINTON AND ESSEX COUNTIES.

The committee to award the honorary premiums between the counties of Clinton and Essex, give the preference to Clinton county—on horses, cattle, except the Devons, sheep, swine, on fruits, flowers, and farming utensils.

They give the preference to Essex county, on Devon cattle, on domestic manufactures, and on the products of the dairy.

The show of vegetables was very good on both sides, but rather in favor of Essex county.

(Signed) HENRY WINTERBOTTOM,
H. DOTY, *Committee.*

COLUMBIA.

The Annual Fair of the Columbia County Agricultural Society, was held on the 1st and 2nd of October. The exhibition in every department was was well sustained, and furnished a gratifying evidence of the increasing interest manifested by our agriculturists in the improvement of the soil and the progress of Agriculture. We rejoiced to see so many of our farmers in attendance, examining all the various articles, and conversing so freely upon the different modes adopted by them in tilling their land, managing their stock, and in the cultivation of fruit. Thus a man is not only able to impart, but to receive information, and we doubt not many profited by what they saw and heard on this occasion. The number in attendance was very large on both days, notwithstanding the weather was unfavorable the second day.

The exhibition in the various departments was in the highest degree creditable to the farmers and mechanics of the county, and was a commendable advance upon any previous exhibition. The show of stock was good, though perhaps not quite equal to the previous year. Some very fine horses were on exhibition. The display of sheep was very good. Of swine,

Digitized by Google

some very superior specimens were exhibited. A Berkshire pig belonging to the Secretary of the Society, not two years old, weighed seven hundred and fifty pounds. There were others exhibited which attracted much attention.

Farm Products.—A wagon loaded with farm products was upon the ground, the first exhibition of the kind before the Society. Its attraction was such, that it is presumed another year will witness numbers presented for the examination of the multitude in attendance at the fair. The miscellaneous department was exhibited separately this year, and was much larger than usual. There were many articles of decided merit, in the horticultural, fancy and domestic departments.

Fruits—The display was remarkably fine, and one that the State cannot, it is believed, surpass. Apples, pears, peaches, grapes, &c., were in great abundance, as well as perfection. In the *vegetable* department the show was uncommonly rich. The variety and quality as well as size of many of the vegetables cannot well be surpassed.

Mr. F. A. Gifford exhibited a card composed of agricultural pruning instruments, beautifully arranged.

The ladies displayed their ingenuity and skill in useful and ornamental articles, which made one of the most attractive features of the Fair.

The following extract, from the report on discretionary articles, from John S. Gould, Esq., chairman, will show the character of the exhibition in this department. The committee report:

That never during the whole history of the Society, has the show of articles been so numerous and so valuable as the present year, nor has the agricultural and horticultural skill of the sons, or the thrift and good taste of the daughters of old Columbia, shone out so conspicuously, as on the present occasion. So numerous and excellent are the articles exhibited, that the task of discriminating between them and deciding on their respective merits, is a work of as much delicacy as magnitude. James T. Perkins, exhibited a grape vine, of the Isabella variety, which had been entirely girdled; above the joint where the girdling had been effected, the vine was abundantly filled with grapes of extraordinary size and most luscious flavor; while those growing between the girdled point and the ground were meager and less highly flavored. This valuable experiment, so interesting to the grape culturist, entitles Mr. P. to a premium. The display of flowers was truly beautiful, and argued well for the good taste and liberality of our flora-culturists. It is hoped that this feature of the Fairs of the Society will grow more and more attractive every year. The plowing match was excellent—and the competitors did themselvesgreat credit.

Mr. J. R. Powell, of Chatham, delivered an excellent address on the

Digitized by Google

evening of the first day, which was listened to attentively by a large audience. On the afternoon of the second day, the annual address was delivered before the Society by J. Sutherland, Esq. From this excellent address we give the following most timely and well spoken suggestions on the subject of *Agricultural Education.*

Before I conclude, I wish to say a word to the farmers here, upon a subject *connected* with Agriculture and its improvements, though perhaps not directly called for by the occasion. Everybody says that Agriculture is a great science, a great art, profession and business; the most important to the People—the foundation and support of all commerce and manufactures; the first, as it must be the last employment of the great mass of mankind; that which feeds all and clothes all. And if this is true of this employment in all civilized countries, how emphatically is it true of it in this, with our immense extent of territory, with its virgin soil, and great variety of climate, and which must forever be essentially agricultural, unless we pervert the laws of nature and throw away the blessings which Divine Providence has so bountifully bestowed upon us. Yes, everybody is loud in their admiration of Agriculture and in their praises of the farmer. Not a candidate for office forgets in his addresses to the electors to express this admiration and these praises—not a member of our Legislature, omits any fit opportunity in words to proclaim the great importance of this Science and art; not an Executive message but that next to the Supreme Author of all, gives the gratitude of the country to the farmer, for abundance and plenty. But when the farmer looks for *action*, gentlemen, for legislation for his benefit and for the advancement of his calling, what has been done? Nothing! To the disgrace of our State, be it said, that *nothing*, comparatively *nothing* has been done by the government to aid Agriculture. No institution has been formed and supported by its treasury where the science and the art could go on hand and hand together, and thus furnish the practical farmer those scientific researches corrected or illustrated by experiments, which he stands so much in need of, and which his limited means, or other circumstances prohibit him from attempting.

This State has done nothing for the education of its children for *farmers*. And pray, why should not children be educated with reference to it, as well as to any other profession or business they are to follow? Indeed, why should not Mineralogy, Botany and Chemistry be taught in our common schools? Why should not the State lend its aid in furnishing the necessary books and apparatus, and in other ways? What knowledge is better adapted to the minds of the young; what knowledge would be more useful to them in after life in working their farms, than the knowledge these sciences give; the secrets

Digitized by Google

which they disclose; a knowledge of the external form and structure not only, but of the internal constituents and condition of those plants, flowers and fruits, of that soil, those stones and rocks, among which they are to spend their lives, and which are to be the subjects of their constant care and labor. This neglect of the interest of the farmer by the Legislature, has not been for want of time to pass laws; for who will say that we have not had laws enough. Every session they make a book; some constitutional, and some unconstitutional, some *unconstitutionally* taking away the rights of one portion of their constituents; and some *constitutionally* enforcing the rights of another portion.

Now, gentlemen, without stopping to inquire into the causes of this past neglect of the Legislature,of Agriculture and of the farmer,and even admitting that the fault is somewhat your own, for lack of unity of purpose and of action and of earnest demand, I will in concluding suggest that which must at once strike you as a remedy for this past neglect, and which will secure you that aid from the Legislature in future which your interests and the importance of Agriculture demand. It is this: the ballot box. Unity of purpose and action, and an earnest demand *through* "the ballot box." Let these gentlemen who want you to send them to the Legislature understand *in this way* that you want, not *talk*, but *action;* not their poetical admiration of Agriculture, but their substantial assistance to it; and then we shall have laws not only for banks and railroads, but for Agriculture and for farmers; we shall have such aid from the government as will bring Agriculture *up to*, and advance it with this "*Age of Improvement.*" Such aid the farmers of this State have a right to ask, and such aid it is the duty of the Legislature of this State to give.

Officers, 1851.—James McGiffert, President; Abraham Pierce, Secretary; Henry C. Miller Treasurer: With Vice Presidents and Executive Committee.

Farm Crops—Award of Premiums.

The specimens were superior to any previous year. Indian corn—80¼ bushels per acre. Carrots—1200 bushels per acre. Wheat and oats very good. JAMES McGIFFERT, *President.*

CORTLAND.

The Twelfth Annual Fair of the Society took place at Cortland Village, on the 11th and 12th of September. The out door arrangements were excellent, and the display of animals, implements, &c., good. Of the former, the number was not so large perhaps as on some former occasions, few being driven in from other towns, but the quality was unusually select. The dis-

Digitized by Google

play of agricultural implements and household utensils was superior to that of any preceding Fair, and the Society are greatly indebted to the Messrs. Freer, for the public spirit manifested by them in adding to this part of the exhibition.

Floral Hall, in the extent of its articles, and the taste and beauty of its arrangements, by common consent, equalled or surpassed any preceding display in this department. To the marshals and other gentlemen having this in charge, and more especially to the ladies of Cortland Village, who perfected these admirable arrangements, the Society and the public are deeply indebted.

The plowing match, on the second day, was spiritedly contested by numerous competitors, and the work performed by them uncommonly good. This is one of the finest features of our county fairs, and the number of competitors should be still much further increased. Next year we hope to see a match in which the male members of the Society will generally compete, each *owner* managing his own team and plow.

Immediately after the plowing match, the Society partook of a well served dinner at the Cortland House, and then repaired to the Presbyterian church to hear the annual address, which was delivered by S. B. Woolworth, Esq., of Homer. Though the speaker expressed regret that the duty had not devolved on a practical agriculturist, the Society felt otherwise. The address was eminently sound, able, and *practical*, and was listened to with marked interest throughout, by an audience which filled the church even to its aisles.

First Class Cattle.

There were twenty-two animals in this class, entered for the inspection of the committee; the most of them too, superior animals, and worthy of prizes. The committee instructed the chairman to report, that the Society is under great obligations to the owners of these animals, for their exhibition here, not only for their intrinsic merit, but as furnishing pleasing evidence of improvement in the breeds of neat cattle.

Dairy Cows.

First Premium, Martin Sanders.

Milk produced during the first week in June,				.....	320 lbs.
Butter	do	do	do	.....	13 "
Milk	do	do	September,	.....	254 "
Butter	do	do	do	.....	9 "

The exhibition of the products of the dairy was excellent, and the display in the miscellaneous articles creditable to the county.

Cortlandville. HIRAM HOPKINS, *President.*

Digitized by Google

Officers 1851.—At the annual meeting held Dec. 27, the following officers were elected: President, Noah Hitchcock. Jr.; Vice Presidents, Israel Boies, Anthony Freer, Paris Barber, Moses Kinney; Corresponding Secretary, G. J. J. Barber; Recording Secretary, G. W. Chamberlain; Treasurer, Morgan L. Webb; Marshals, Ira Bowen, Amos Hobart, D. S. Munger; Executive Board, Manley Hobart, Benjamin Salisbury, Stephen Patrick, David Hardy, A. L. Chamberlain, Peter Walrod, Wm. R. Randall, Lyman Hubbard, F. H. Hebberd, James Hitchcock.

On motion of Noah Hitchcock, Jr., a committee of three were appointed by the chair, namely, Amos Rice, A. Freer and J. J. Adams, to prepare and offer resolutions in reference to the recent decease of WILLIAM RANDALL, Esq.

The committee appointed to prepare a minute on the recent decease of Wm. Randall, Esq., beg leave to submit the following resolutions:

Resolved, That the Cortland County Agricultural Society have heard with deep regret of the death of WM. RANDALL, Esq., on the 23d inst., a prominent agriculturist of this county, and an Ex-President of this Society, who from its first organization has been one of its most efficient supporters and liberal patrons; that we recognize in him, as a citizen and a gentleman farmer, those valuable traits of character, always necessary to success, urbanity and kindness, a prudent forecast, and a persevering energy.

Resolved, That this Society tender their sympathies to the family of the deceased in this hour of affliction, on the great loss they have sustained, the loss of an affectionate husband, and an honored father.

Resolved, That the secretary of the meeting be requested to forward to the family of the deceased a copy of these resolutions, and as a tribute of respect to his memory, that they be entered on the journal of this Society, and be published.

DELAWARE.

The undersigned, President of the Delaware County Agricultural Society, submits the following report:

The past year has been one of prosperity to this Society. More than usual interest has been taken in its proceedings by the farmers of the county, and the opinion is prevailing among them that, properly sustained, the Society may become of increased benefit to them. The list of members of the Society is greater at the present time than at any former period. Adjourned meetings of the Society were held in different towns in the county during the past summer, which were addressed by the President, and by

Digitized by Google

other friends of Agriculture, and which are believed to have had a good result.

The Annual Fair of the Society was held in the village of Hamden, on Wednesday, October 16th, and was numerously attended. The show of cattle was larger than at any former Fair of the Society, and the animals exhibited were, many of them, of rare excellence. Quite a large number of Devons, and grades of that breed, were offered, and justly attracted public attention. This breed of cattle is believed to be peculiarly adapted to our locality and wants, and is therefore becoming popular in this county. The show of sheep was not large, but those exhibited were thorough breds, and fair specimens of the different breeds. They consisted of Merinos, Cheviots, Bakewells, and South Downs. Regrets were expressed that some of the superior Saxon flocks, kept in the county, were not represented. The show of horses, though not large, was meritorious. The exhibition of fruits and vegetables was well sustained. The beautiful and elaborate specimens of ladies' handiwork, were much admired, and constituted a highly interesting feature of the occasion.

The receipts of the Society during the past year have been as follows:

From the State Treasury,	$106 00
From voluntary contribution,	123 00
Balance from last year	9 30
	$238 30

The above amount, less a balance of $2.80, has been expended, in premiums, $222.10; incidentals, $13.40.

The volumes of Transactions and proceedings furnished the Society have also been distributed as premiums, and are perused with pleasure and profit by those into whose hands they fall. It is believed, they are exerting a silent but powerful influence upon the public mind. Agricultural journals, (especially the "Cultivator,") are extensively patronized among us, and highly valued. They contain a fund of valuable and interesting reading for the farmer, the true worth of which is beginning to be duly appreciated.

SAMUEL A. LAW, *President.*

Officers, 1851.—President, Samuel A. Law, Meredith; Secretary, E. H. Olmstead, Delhi; Treasurer, M. L. Farrington, Delhi.

DUTCHESS.

The Dutchess County Agricultural Society, held its Tenth Annual Fair at Washington Hollow, on the 2d and 3d of October. This show far

Digitized by Google

exceeded any former one in the interest manifested by the visitors and members, and in the superiority of the stock exhibited. In some classes, especially in working oxen, sheep, brood mares and colts, and horses, the show would have favorably compared with any show in the State. The domestic hall was beautifully decorated, and on the tables were many well arranged floral ornaments, and splendid specimens of the fruits of the season, while the department of manufactured goods gave good evidence of the taste and industry of the farmers' wives and daughters, and of the skill of the mechanics who sent in specimens of their work. Besides the premiums awarded in money and diplomas, a large number of books were distributed to the successful competitors, comprizing the best selections from the numerous agricultural publications of the day, and including a number of the Transactions of the State Society and the American Institute. The latter works are being much sought after, and are highly appreciated by the Society, and those who are fortunate enough to secure them. Several are now striving for them with the hope of obtaining a full set. The Society, by a regulation for the purpose of increasing its usefulness, receive the pay of members in advance, which entitles the members to a copy of the Cultivator, or American Agriculturist. It can be easily seen that great advantages must arise, by distributing a considerable number of such excellent agricultural periodicals.

The next show will be held at the same place, on the 2d and 3d days of October, 1851. BARCLAY HAVILAND, *Secretary.*

Officers, 1851.—President, Cornelius Du Bois, Poughkeepsie. Vice-Presidents, Thomas Tabor, Henry Mesier, J. F. Sheafe, Aaron Vail, Calvert Canfield, J. W. Wheeler. Recording Secretaries, Barclay Haviland, Samuel T. Tabor, Washington. Corresponding Secretaries, S. B. Trowbridge, Poughkeepsie; R. G. Coffin, Washington; Abraham Burton, Chesnut Ridge. Treasurer, Henry A. Field, Poughkeepsie.

Indian Corn.

Statement of five acres of corn raised by A. L. & H. P. Allen, Poughkeepsie: The field, consisting of about twelve acres, had laid to grass for several years. The soil is a sandy loam, some parts inclining a little to gravel. In the early part of May last, drew on about one hundred and fifty loads of barn-yard manure and spread upon the sod, which was then turned over, plowing to the depth of about eight inches. The surface was smoothed with a light harrow, without disturbing the sod.

The seed was the common eight and twelve-rowed yellow corn, and was planted between the 22d and 29th of May, three feet apart each way, the

Digitized by Google

ground having been marked out with a light plow for that purpose. The seed was prepared as follows, viz: To three bushels of corn, take two pounds of glue and dissolve it in eight quarts of water; sprinkle it on the corn, and stir it until thoroughly wet. Then sprinkle on four double handsfull of guano, or its equivalent of hen manure, continue stirring or shoveling the corn over, and sprinkle on wood ashes, lime and plaster, an equal quantity of each, until the moisture is absorbed. The kernels will then not adhere to each other, but will be covered with a dry coating of the above substances, and may be planted at leisure. The corn was plowed twice in a row each way, and hoed once, commencing about the 14th of June, and finishing about the first of July, after which a part of the field was again plowed as before, but at least three acres of the *westerly half* of said field, (which includes said five acres,) were plowed but one way. This was the case with nearly two out of said five acres. Our hay and rye crops prevented our giving further attention to the corn. The corn was cut up at the ground in October, and husked in the field in November.

The amount of corn raised upon said five acres by us the season last past, having been measured in a sealed half bushel measure, was three hundred and thirty-six bushels and three pecks—equal to sixty-seven bushels and one and a half pecks per acre. A part of this corn has been sold, and, being weighed, overrun the measurement about one pound to the bushel.

The above statement is verified by the affidavits of H. D. Myers, surveyor, and Thomas Bennett, who assisted in Cultivating the field, and in gathering and measuring the crop.

ERIE.

We held our Tenth Annual Fair at Aurora, September 18th and 19th, 1850. All previous ones having been held in the city of Buffalo, and in consequence of the little interest being taken by those in the country towns, the Society had almost become extinct; consequently at its Ninth Annual Fair in the city, it was thought advisable to remove it into the country. Accordingly it was adjourned here for this year, and the result has shown the wisdom of the change.

The exhibition of horses, cattle, sheep, and other stock, was too numerous to mention in one report. One hundred and thirty-three cattle, eighty-nine horses, seventy-three sheep, twenty-three hogs, and various other animals were entered in competition for the premiums, and hundreds of other animals were present, but not offered, many of them worthy of especial notice. Farm products were offered of various kinds, in

Digitized by Google

great abundance. Household and domestic manufactures were equally represented. In the mechanical department they were not so numerous, although some good specimens of wagons, plows, ox-yokes, horse-rakes, stoves, &c., were very creditable to the skill and enterprise of the workmen. Messrs. Jewett and Root, of Buffalo, presented some splendid parlor stoves, equal, if not superior, to any ever offered to any community.

The ladies' department was fully represented by numerous articles of handiwork, such as quilts, coverlets, carpeting, hearth rugs, shawls, fulled cloth, stockings, mittens, table cloths, toweling, and a great variety of needlework.

It was estimated, that at least eight thousand persons were present, and take the exhibition as a whole, it far exceeded any of its predecessors since the organization of the Society, and seemed to stimulate all present with the importance of taking more interest in future exhibitions.

The amount of premiums offered was.....	$550 00
do do awarded was	845 50

Besides some fifty volumes Transactions, and more diplomas than we were prepared to furnish.

Farms.

The committee reported but one farm offered for examination, and that owned by John Raynor, of Clarence. The committee, after an examination, pronounced it in a high state of cultivation, containing two hundred and twenty-four acres, well arranged as to divisions and convenience of cultivation, a good bearing orchard, with well arranged buildings, and a superior garden. The committee awarded the first premium of $10, to John Raynor, for the best farm.

Officers 1851.—Apollos Hitchcock, of Cheektowaga, President; John S. King, Amherst; Alonzo Raynor, Clarence; W. R. Coppock, Buffalo; Charles Baker, Colden; John Webster, Hamburgh; B. W. Pratt, Collins; Oliver Patch, Wales; Orren Mayo, Concord; Ira McCall, Aurora; Josiah Fullerton, Alden; N. G. Stebbins, Cheektowaga, Vice Presidents: Henry Atwood, Lancaster, Treasurer; Henry L. Bingham, Lancaster, Secretary.

The Society adjourned, to hold its next Annual Fair and Cattle Show at Lancaster.

AARON RILEY, *Secretary.*

Aurora, December, 2, 1850.

Digitized by Google

ESSEX.

The Annual Fair of this Society occurred on the 25th and 26th of September, in conjunction with that of Clinton county. The Fair was held at Keeseville, and the same enclosure again occupied which was referred to in our last report, and a description of which belongs particularly to our sister Society. The grounds have been much adorned, and made more commodious by the erection of a tasteful and appropriate edifice, dedicated to Flora and Pomona. The enclosure, and the various buildings and appliances connected with it, render the grounds among the most extensive and well arranged in the State, for the purpose to which they have been devoted. The public are indebted for the recent improvements to the energy and zeal of the committee of the Clinton Society. The weather was favorable, and a vast concourse of farmers and spectators were assembled, far exceeding that of any preceding year.

The occasion was one of deep interest, and we feel assured that its influence will be enduring upon the prosperity of both counties. The competition in this Society was, in numerous departments, very animated and gratifying. The number of entries was far greater than at the former Fair. The display was excellent, and extensive in manufactures, female industry, and miscellaneous articles, indicative of great progress in these branches. The exhibition of horses we presented is seldom equalled. We pride ourselves upon the excellence of our breed of horses, and the reputation of our stock on this occasion was fully sustained. In addition to the Black Hawk family, which has established so high a character for a combination of elegance, action, vigor and endurance, we are introducing into the county very extensively an infusion of the blood of imported thorough bred horses. The growing attention to this department of husbandry promises the most important results, and it is the design of our Society to cherish and promote it by every practicable expedient.

The entries of neat cattle were highly respectable. The appearance upon the grounds of a number of very choice and beautiful Devons, from the herd of Mr. John Brown, residing in one of our most remote and secluded towns, attracted great attention, and added much to the interest of the Fair. A peculiar and decided influence claimed for these Agricultural associations, has been strikingly illustrated by the effect produced on the mind of this community, by the exhibition of these animals. The interest and admiration they excited have attracted public attention to the subject, and has already resulted in the introduction of several choice animals into this region. We have no doubt but that this influence upon the character of the stock of our county will be permanent and decisive. A few superior sheep

Digitized by Google

were exhibited, but the entries did not sustain the character of our wool-growing interest.

We regret to report but a slight and inadequate competition for the premiums offered for farm and field crops. The Society intend, if possible, to arouse a stronger interest and more attention to these pre-eminently important departments of agriculture.

The county of Essex is extended over so wide a territory, and so disconnected by its broken and uneven surface, that it is impracticable to concentrate an exhibition of its agricultural productions. Our fairs must embrace, therefore, only a local, rather than a general display of the resources of the county; and hence an unfavorable, but false, estimate may be formed of our agricultural capacity and condition. The effect of the Society has been, however, to draw together from the various sections of the county many of the most prominent and intellectual of the farming classes. We find in this communion, and in the comparison of opinions and exhibition of modes of husbandry and resources, the development of a progress and position of our agricultural affairs in the highest degree animating and satisfactory. The farmer of Northern New-York occupies the most favorable situation, and enjoys the highest advantages of market, both as to price and demand for all his commodities. We may assert, in connection with this conceded position, that parts of the county of Essex favorably compare with most sections of the State, as well in the native fertility of the soil as in the progress of its *artificial improvement.*

A combination of such advantages authorizes the anticipation of a high progression to the agricultural interests of the county. We trust that our Society will exercise a powerful agency in promoting and accelerating these results.

The Union of the Fairs of Clinton and Essex counties was attended with all the favorable effects contemplated in the most sanguine expectations. The numbers who were attracted by this arrangement were vastly increased. The emulation excited between the Societies quite equalled in its influence upon the exhibition, the extent and quality of entries, the beauty and variety of animals and fabrics displayed, that is exerted by the ordinary competition between individuals. The interest of the occasion and its useful consequences in every department were promoted by this plan; no where else, it is believed, existing in the State. With a design of exciting a higher and universal spirit of emulation between the counties, and of attaching increased zest and animation to the scene, the officers of the Clinton Society proposed, and the gauntlet was readily taken up by Essex, that the Societies should engage in an honorary competition at the Fair,

Digitized by Google

their respective claims to be submitted to foreign judges, mutually chosen. This arrangement was announced some time preceding the Fair. The points of rivalry to be thus adjudicated, were these: Which Society excelled in the exhibition of horses, neat cattle, swine, and sheep, respectively, regard being had to the extent and quality of the entries; and also, which Society excelled in the general exhibition, in all it branches. The awards of the judges, it was stipulated, should be entered upon the record of each Society, and embraced in its report to the State Society. This novel passage at arms in our agricultural chivalry excited an universal interest. The judges selected were attended on their examination by a representative of each Society, to present its entries and to protect its claims. In accordance with the understanding we incorporate in this report their decision, which was as follows:

The committee on the exhibitions of the Clinton and Essex County Societies, report as follows:—We awarded the preference to Clinton county on horses and cattle, with the exception of Devon cattle, which we give to Essex county. Also, the exhibition of sheep and swine to Clinton. On domestic manufacture we give the preference to Essex. Fruits and flowers, to Clinton county. Vegetables, very good on both sides, rather in favor of Essex county. The exhibition of farming utensils, to Clinton county. The productions of the dairy, to Essex.

(Signed) HENRY WINTERBOTTOM, *Canada East*,
W. DOTY, *Saratoga Co.*,
Committee on Exhibition.

We deeply regret that an universal sentiment does not prevail favorable to a perpetuation of these combined Fairs, and that it is uncertain whether they will be maintained.

The Rev. Dr. Wheeler, late President of the Vermont University, delivered the annual address, a production of remarkable eloquence and ability.

It appears from the treasurer's report, that the financial affairs of the Society were as follows:

Money on hand date of last report,		$77 05
Cash received from the State,		71 00
From memberships and other sources,		223 54
		$371 59
Paid for premiums,	$288 50	
Incidental expenses,	67 14	=$355 64
Balance on hand,		$15 95

January, 21, 1851. W. C. WATSON, *President.*

Digitized by Google

At an adjourned meeting of the Society, it was unanimously resolved to locate the annual fair for the *next successive five years at Elizabethtown.*

Officers elected—President—Winslow C. Watson, of Chesterfield; Secretary, Robert S. Hale, of Elizabethtown; Treasurer, De Witt C. Brown, Elizabethtown, and eighteen Vice Presidents.

The following resolutions were adopted:

Resolved, That in the opinion of this Society, the cause of Agriculture has been advanced by the efforts already made, and we pledge ourselves to united action and perseverance in the future.

Resolved, That we are gratified with the success of our sister Society of Clinton county, and we tender to them our thanks for their kindness in affording us the use of their grounds for our first and second Fairs.

Resolved, That we appreciate the enterprise of the people of Chesterfield for the interest they have manifested in starting this Society into life, and vigor.

Resolved, That the thanks of this Society are due to its officers for their diligence, and perseverance in conducting it to its present elevation.

Resolved, That Winslow C. Watson, for his eminent and valuable services as President of this Society, is entitled to its warmest thanks.

FULTON AND HAMILTON.

The Annual Exhibition of the Society was held at the Court House, in the village of Johnstown, on the 18th and 19th days of September.

The officers of the Society entertained high hopes of an augmented increase in every department of agriculture and the arts, but were much disappointed.

Our list of articles was considerable less than the previous year, in consequence of a misunderstanding in changing the time of holding our fair, from the first publication to an earlier day, which deranged the whole system of operation.

The exhibition of horses, cattle and swine, was quite respectable, and evinced that spirit of emulation which manifested itself the previous year. Of the productions of the loom and needle, only a few specimens were exhibited, but, which gave the best evidence of the ingenuity and skill of the manufacturer.

Two field crops were entered for premiums, by George Logan of West Galway.

From 144 rods he raised twenty-three bushels, three pecks of buckwheat; net profit, ... $8 87

Digitized by Google

From quarter of an acre, r ised 170 bushels of carrots, equal to 680 bushels from the acre—value 170 bushels,	$25 56
Expense of cultivation,	9 75
Profit on crop,	$15 75

The following are the officers for the ensuing year—William Logan, of West Galway, President; James Edwards, of Ephratah, Vice President; Peter T. Yost, of Johnstown, Secretary; Archibald Anderson, of Johnstown, Treasurer; and an Executive Committee of fourteen members.

The following is a report of the finances of the Society, by A. Anderson, Treasurer, for the year 1850:

By balance in the treasury from 1849,	$24 12
To amount received for membership, entries, &c.,	75 25
Amount received from the State treasury,	60 00
	$159 37

Expenditures.

By amount of premiums awarded and paid,	$104 75
Incidental expenses, printing, &c.,	33 56
Leaving a balance in treasury of,	$21 06

WILLIAM J. ROBB, *Secretary.*

West Perth, January 14th, 1851.

GREENE.

The third annual report of the Hon. Z. Pratt, President of the Greene County Agricultural Society in 1847, is so full and replete with statistical information, relative to every thing connected with the Society and the county, that I deem it but an act of supererogation to say more, than that the latter has steadily increased in all her industrial pursuits, and made an advancement in them all worthy of her hardy sons.

The Ninth Annual Fair of the Society was held at Windham Center, east of the mountain, on the 24th and 25th of September, and was the largest, and better attended by the farmers and mechanics than any previous Fair. They turned out from every nook and corner of the mountain county, bringing along with them their wives and daughters, and such stock and produce as they deemed worthy of exhibition or exchange. It was a glorious sight to witness the good feeling which everywhere prevailed, the interest all manifested in sustaining the Society, and the honest competition which these fairs beget among all classes of our citizens.

Digitized by Google

In all departments, the exhibition was not only creditable to the county, but unsurpassed. The show of stock was all that could be desired, and evidenced the attention which had been given to this branch of agriculture, and the success that had resulted from such attention. The display in the domestic department was good, and evinced the taste of our county ladies, in the useful as well as ornamental, to be equal, if not superior, to those of any other county. The dairy department was fully sustained, and received the approbation of all who saw the fine rolls and pots of butter, and nice cheese, that were displayed on the occasion. In the fruit and vegetable department, the display was excellent, and manifested the attention which had been bestowed, in the improved varieties on exhibition, and which I trust will continue until nothing but the very best is produced.

The plowing match occurred on the morning of the second day, and elicited considerable excitement. The competition was spirited, and told well for the competitors in the rapidity as well as execution of the performance.

In the afternoon, the people assembled on the show ground to listen to the exercises which had been prepared for the occasion, to wit: singing by the choir, addresses, reports of committees, and the premiums awarded. The first address was by D. K. Olney, Esq., and was an able, scientific, and well delivered one—all seemingly delighted with the premises which he laid down, and the applications deduced therefrom. He was followed by the Rev. Mr. Fitch, who chained the attention of the large audience for nearly two hours, to the great gratification of the farmers of Greene; and was an effort worthy of the man and the occasion, and one that no pen of mine can adequately describe. Col. Pratt was then called for, and gave a few practical remarks on the subject of Agriculture, and the improvements he had witnessed since his sojourn in the mountain towns of Greene, effected by the toil of the hardy yeomany, which were enthusiastically received. A few observations were made by A. Marks, Esq., and the reports were read and premiums awarded. Thanks were tendered to the speakers and to the citizens of Windham, for their kindness and attention in furnishing accommodations for the Fair.

The officers of the Society for 1850, were:—President, Col. George Robertson, Windham; A. Marks, Durham, and Isaac B. Hinman, Secretaries; Lewis Sherrill, Greenville, Treasurer. Four Vice-Presidents, and an Executive Committee of twelve.

In concluding this, my first annual report, I cannot but express the high gratification I feel in witnessing the noble spirit that seems to manifest itself among our farmers and mechanics, and the ladies also, in advancing

Digitized by Google

the interests of the Society. It evidences that they have realized its worth, and that henceforth its history will be one of prosperity and progress.

GEORGE ROBERTSON, *President.*

Officers, 1851.—President, George Robertson, Windham Center; Vice-Presidents, Edward Johnson, Durham; Stephen Steele, Windham Center; Stephen Hotchkiss, Cairo; Joseph C. Tiffany, New Baltimore; Recording Secretary, Isaac B. Hinman, Jewett; Corresponding Secretary, Horatio L. Day, Cairo; Treasurer, A. Marks, Durham; and twelve Executive Committee.

Next Fair to be held at Coxsackie. Stewart Austin, Andrew Baker, Roswell Read, James Hawley, Joseph C. Tiffany, and John Guthrie, committee of arrangements.

GENESEE.

The undersigned, President of the Genesee County Agricultural Society, would respectfully report, that since the last report the interest in our Society has been such as to afford to all its friends the strongest evidence of its usefulness and stability.

The towns in our county are becoming strongly interested in agricultural exhibitions, and a competition has sprung up which has been and is productive of much substantial good to the farming community, promising the attainment of the highest perfection in breeding of domestic animals, and in cultivating the soil. During the year, town fairs have been held in the towns of Darien and Pavillion. They were well attended, and their exhibitions would bear no mean comparison with the early exhibitions of the County Society.

A society has also been recently organized in the town of Le Roy, and we are in the expectation that the time will speedily come when every town in the county will have its own society, auxiliary to the County Society, and contribute of its vegetable and animal productions, with its domestic manufactures, to enrich our exhibitions.

Our plowing match, and show of stallions, was held in the month of June, and there was a very large attendance of the yeomanry of the county, with a more elegant display of stallions than we have ever before witnessed here; and the plowing was done in a manner highly creditable to this far-famed wheat-growing district, and afforded ample satisfaction to all by demonstrating the fact that the plows, teams and plowmen, were capable of turning under from two to three tons of clover per acre, ten inches below the surface.

The show of cattle, sheep, horses, swine, farming utensils, mechanic arts,

Digitized by Google

domestic products, and manufactures, was held at Batavia, on the third and fourth of October, and the people came up *en masse*, to witness such a display as has never before been witnessed in the county. No occasion has congregated more people in Batavia than this for many years. Genesee Agricultural Society truly came out in her strength, there being by estimate, between eight and ten thousand persons on the ground.

The number of horses, cattle, sheep, and domestic articles exhibited, were of kinds, qualities, and grades to do credit to any county in the State, and of which the people of our county may justly be proud.

I would respectfully suggest that the Executive Committee of our State Agricultural Society, in fixing upon a time for holding our State Fairs, should be more mindful of the convenience of our western agriculturists, as until the *fifteenth* of September the wheat sowing season continues, and by reason thereof the Fair being at an earlier period, multitudes who would otherwise do so, are prevented from attending this State jubilee.

S. HESTON, *President*.

Batavia, Jan. 1st, 1851.

Receipts and expenditures:

Balance last year,	$68 28	
From State,	92 00	
Sundries,	22 26	
Subscriptions,	87 00	
Members,	227 79	
		$497 33
Paid out premiums and expenses,	$343 25	
Balance in treasury,	154 08	
		$497 33

Officers 1851.—J. E. Tompkins, President; B. Young, Secretary; C. Kirkum, Jr., Treasurer.

HERKIMER.

The Annual Fair was held in the village of Herkimer, on the 15th of October, and was a very successful one, and gave cheering evidence of the onward progress of the agricultural interest in the county. The exhibition of stock in the various departments, was in the highest degree creditable to the farmers; and the dairy exhibition gave assurance that this growing interest is not neglected, but is making steady progress and improvement in the county. In the mechanical departments, and in that of domestic manufactures, there was a creditable display.

Digitized by Google

The officers and members of the Society have great reason to be encouraged with their prospects, and there can be no doubt that Herkimer county will do her duty. The farming interest seems to have awakened from its lethargy, and is determined to enjoy the means of improvement which are placed within its reach, and to do credit to this great and all important industrial pursuit.

The annual address was delivered by the Hon. Ezra Graves, President of the Society, and was extensively circulated in the papers of the county.

Among the standing premiums to be awarded by the Society, is one to the person who will exhibit the most profitable management of an entire farm for one year, taking into account interest on the value of land, labor expended, and all expenses—the improvement made in the condition of the farm during the year, and the value of all products. This will produce, it is believed, extensive competition, and practical results of no ordinary importance will eventually accrue to the entire farming interest.

Annual Meeting.

The Annual Meeting of the Society was held on the third of February, 1851, when a large number of persons were in attendance, evincing a lively interest in the future well being and prosperity of the Society. Lists of members were handed in from the several towns, numbering from thirty to sixty each.

Officers elected for 1851.—President, Hon. E. Graves, Herkimer; Secretary, A. L. Fish, Cedarville; Treasurer, Robert Earll, Herkimer; and nineteen Vice Presidents and an Executive Committee of the same number.

Extract from the address of Hon. Ezra Graves:

Agricultural Science.

The human mind, like the human body, requires a change of exercise and employment, to fit and prepare it for usefulness to the world, and make it agreeable to those with whom it mingles, and useful to those whose happiness and welfare depend upon its exercise; and he who fails to cultivate his reasoning powers for any other purpose than merely to subserve his own private notions, or his own cupidity and selfishness, deserves not his habitation in a land of freedom, and in a country and climate so happily calculated to invigorate and strengthen every effort of the human intellect, to dispense joy, diffuse knowledge, and to cast into the circle of a broad and extended acquaintance a halo of light, a beacon of intelligence, and the oil-can of tranquility and satisfaction. And while our common schools, academies and colleges are shadowing forth their benign influence, and giving to scholastic genius a brilliant and enchanting view of the last and most

Digitized by Google

elevated round in the ladder of fame, the world is becoming satisfied that the cultivation of the soil upon which God placed his creature man is an elevated, and important science, the beauties of which are not seen or enjoyed by the freshmen in the class of Agriculture

It may be asked, what is meant by agricultural science? and how is the science to be acquired, and who are the teachers? I mean, by agricultural science, an analysis of the soil, and a comparison of its yearly products; enabling the careful learner always to fit and prepare his ground to meet the demands of the seed that he sows, or plants, and qualifying him to select the suitable field for the particular species of grain that he intends to raise with such prudence, foresight and experience, that he will be amply compensated for his toil in an abundant crop. And how is this science to be acquired? I answer, would it be difficult for the agriculturist, or horticulturist, to determine what his lands were best calculated to produce, who should sow three kinds of grain in the same field, the grounds of which are equally well fitted, if he watched with care the growth, ripening and harvesting of each kind; and then estimated the quantity and the value of each, in proportion to the labor and expense incurred upon each? There are but few crops in this country but what pay the cost of growing them, and very many pay from fifty to a hundred per cent., and not unfrequently even more than this. If the farmer can make the experiment successfully upon one field, I see no good reason why he cannot upon his whole farm. These experiments made, and entered in a journal, which should be kept by every farmer, he would be able at all times, by referring to his journal to ascertain the year, and the crop that he had upon a particular part of his farm, and upon every field of his farm; thus enabling him to fit and prepare his land for that kind of crop which pays the best, with the least labor and expense. And is this knowledge not worth acquiring? And allow me to ask how this labor-lessening and money-saving knowledge is to be acquired by the common farmer, with his common education, in any other way? The agricultural chemist, who by chemical appliances, can analyze the soil, and determine its properties, aided by botanical researches, can determine the different properties of the different productions in the vegetable kingdom, and the soils that contain the ingredients congenial to the growth of the plants, grains and herbage, which he wishes to produce. And this knowledge of which I have spoken is to be desired, because it is always reliable, for the earth is like its Divine Creator, ever ready to yield its blessings to those who justly merit them; and the husbandman who pays the soil for its benevolence to him, by judiciously manuring, and skillfully fitting it, and adapting his seed to the proper field,

Digitized by Google

will never look upon his cultivated fields and charge them with having extorted from him labor and toil, without returning a liberal equivalent. And who that has toiled and sweat upon lands made barren by his repeated drafts upon her, without feeding her with even the stalks of her own productions, has not learned the sorry lesson, at the expense of his personal health and comfort, as well as by the chagrin and mortification with which he is met, by finding the productions of his farm too scanty to fill a barn of small capacity, or granary of limited dimensions.

JEFFERSON.

The Annual Fair was held at Watertown, on the 12th and 13th of September, and the show of cattle, horses, and sheep, upon the ground, indicated clearly that our county is making rapid advances in improving the different kinds of animals best suited to our climate and soil. At our extensive Hall, erected for the purpose of exhibiting articles of domestic manufactures and agricultural implements, there was an unusual display of the products of the dairy, the garden, the orchard, and the workshop. The ladies' handiwork has never been equaled. The attendance was unusually large—estimated from ten to twelve thousand.

On the second day of the Fair, the plowing match came off, in a very spirited and interesting manner. The plows were of various patterns, and the work done equal to any in the State. Jefferson is not behind any of her sister counties in appreciating the benefits derived from these annual Exhibitions of the products of the soil, the manufactory and the workshop.

Within a few years past, a great change has come over the Agricultural interests of the county, by a largely increased attention to the dairy, instead of grain growing. Experience has proved the change to be of great importance, by a rapid increase of wealth and prosperity among that class of farmers.

Some portions of the county have suffered severely by the potato rot, while other portions have entirely escaped.

The winter wheat growing portions of the county have suffered severely by the wheat weevil; but our farmers have found that the Black Sea spring wheat resists them. This wheat is found to be a very good substitute, for home consumption, but will not do to export.

The rains have fallen at Plesis, in this county, in

May, ...	3.07 inches.
June, ...	1.89 "
July, ...	6.17 "

Digitized by Google

August,	3.71	"
September,	5.95	"
October,	3.72	"
November,	3.78	"
	28.29	"

Statement of the funds of the Society for 1850, and a list of officers for 1851:

1849, Dec.	Balance in treasury,	$430 78
1855, Sept.	Rec'd from members, and admission into the Agricultural Hall,	526 54
	Rec'd from Treasurer of State,	183 00
	Books sold, and paid as premiums,	21 00
		$1,161 32
	Paid for winter premiums,	55 00
	Sept., 1850, premiums,	671 00
	Contingent expenses,	178 10
	Balance in hands of treasurer,	257 22
		$1,161 32

At the annual meeting of the Society, held 8th January, 1851, the following officers were elected:

Marcena K. Patrick, President, Sacketts Harbor. Vice-Presidents—Edward S. Salisbury, Ellisburgh; Geo. Brown, Brownsville; George White, Rutland; Wm. Sill, Rodman; Ambrose Potter, Adams; David Granger, Champion; Jason Rice, Watertown; Chester C. Symonds, Hounsfield; Azel W. Danforth, Philadelphia; William Carlisle, Lyme. Edward S. Massey, Recording Secretary, Watertown; John C. Sterling, Corresponding Secretary, Watertown; O. V. Brainard, Treasurer, Watertown.

JASON CLARK, *President.*

Extract from the report of the committee on farms, dairies and nurseries:

The committee on farms, dairies and nurseries, commenced their visitation on the 19th of August, and closed on the 30th, having devoted ten days to the duties assigned them. Taking this village as the starting point, the committee traveled some 290 miles, examined twenty-nine farms, twenty-six cheese dairies, fourteen butter dairies, and four nurseries; to say

Digitized by Google

nothing of the gardens, orchards, and melon patches, with which we were made acquainted; the bee houses that we peeped into, merely to see how such nice honey was made, or the pigs, and calves, the colts and steers, that we passed judgment on.

Though our duties have drawn upon our time heavily, and a little too on our pockets, we have indemnified ourselves, by noting down in our private memoranda the places where we can find nice stock, when *we* want to buy; nice seed grains, to sow on *our own* farms; convenient barns, from which *we* can copy when we overhaul *our* old ones; intelligent dairy-women, who can tell us all about the *modus operandi* of making a *little better* cheese and butter than anybody else; and last, but certainly not least in importance, each noted on the tablet of memory, many a place where he hopes night may again overtake him, and thus compel him to keep his promise made to "call again."

To speak of the hospitable manner in which we were received and entertained by the farmers throughout the county, seems almost unnecessary. Acting as the agents of a Society that is honored by every intelligent farmer, visiting their homes by special invitation, we could not be regarded otherwise than as friends. As such we were greeted in every place, and our only regret in leaving was, that we could spend so little time in any one family.

To some of us, who had not travelled over the county for many years, the change and improvements that have been made, are far greater than we anticipated. Especially is this true of the country north of Black River—the towns of Orleans, Clayton, Alexandria, Theresa, and Philadelphia, which but a few years ago presented only here and there a *clearing*, with its log cabin, now showing some of the finest farms and farm-buildings in Jefferson county, while the dairies are second to none in *any* county. The older and wealthier towns south of the river must put on their strength and labor more vigorously, work with a *heartier* energy, if they expect to keep the lead in agricultural pursuits. Let the rich farmers south of the river, who keep money in the bank, drive north when they come to town to make their next deposits, and take a look at the fences and buildings, the stock and the dairies, the crops, and the profits; aye, and let them look, too, at some of the orchards, often as it has been said that fruit will not grow on the lime rock, north of the river. Perhaps it will *not* grow *on* the bare rock, but friend Bartholomew will show them a way *he* has of making trees grow *between* the rocks, and produce as fine and luscious fruit as ever tickled the palate of a gourmand. Farmers of the south, you must brush up Otherwise you must soon *follow*, where you have hitherto led.

The hay crop of this season is unusually heavy, and the meadows are

Digitized by Google

clothed with abundance of after-feed. Few of the meadows had been thrown open for cattle when we made the rounds, there being ample food, as yet, in the pastures. For dairying, the prospects of a heavy fall yield is very flattering. Up to the present time the season has been a very difficult one for dairymen; the moist, damp atmosphere rendering it almost impossible to prevent cheese from moulding.

The grain crop, though large, will not turn out so heavy as appearances would indicate. The growth of straw and stalk is enormous, but the ears and heads are not so well filled as in some former seasons. Especially is this true of winter rye, which has given only a fair yield, while the stalk, in many fields, might average five and a half to six feet in height, and in some instances showing single stalks of seven and eight feet high.

The potato had begun to exhibit signs of disease, in some localities, before we had completed our tour of observation, but we do not learn that it has extensively affected the crop, which promises to be very heavy; though there will be only about the same proportion of tubers to the vine, as there is of grain to the straw.

During our tour we had frequent opportunities of witnessing the operations of a new enemy, or nearly new, which is making fearful ravages among our forest trees.—This scourge comes to us in the shape of a small worm, or caterpillar, which makes a little nest upon a limb, and remains for days and weeks almost unnoticed. Suddenly we find the entire tree enveloped in a web, and the single caterpillar now become a million, leaves not the vestige of a leaf upon the bald and withering head of hickory, ash or elm. Nor are their depredations confined to forest trees alone—the cherry trees, in many places, have been stripped of their foliage, and the silken web of the destroyer is already cast over the apple. By the most careful attention to our fruit and ornamental trees, cutting and burning every branch on which the nest appears, we may hope to save our orchards and gardens, but it is now too late for us to do anything in the way of saving the timber of the low grounds and swales, on which so many of us depend for the material of our fences. It is the duty of every person engaged in agriculture, and of every good citizen, to check the first appearance of an enemy like this, before the evil has spread so widely as to defy all attempts to suppress it. The lopping off and burning of a single bough, might have saved a forest that now stands leafless and ruined.

We stated in the commencement of our report, that we examined twenty-nine farms. Some of them were excellent farms, very productive, and many of them well kept; but Jefferson county ought to show a better farm than any we were called to visit. We saw many *good* farms, but *not one*

Digitized by Google

that was enough better than the *many*, to have "A, No. One" marked against it in our note books. We have awarded no premium for the best farm in the county. The first competitor for a county premium, whose farm we visited, was Albert Rice, of Adams. We found a productive farm, in a good state of cultivation, large barns well filled, first rate fences, and excellent orchard, and thistles all cut along the roadside bordering his premises. Mr. Rice received the fifth county premium for his farm last year, to which he was well entitled, if it was in as good condition then as now. But as we know he has all the materials gathered for building a new house next year, and the dollars in his pocket to complete and furnish it, the committee concluded to dine with him when that new house is finished, take a look through it from garret to cellar, examine the fitting up of his barns to correspond with his house, stroll over his farm, and, in all probability, mark "A, No. 1" against it.

We visited the farm of Mr. J. M. Cleveland, also of Adams, to which a town premium was awarded by the viewing committee of last year. So far as good management, system, economy, and returns for labor are concerned, we coincide in opinion with that committee—it is second to none in the county. Time only is required to make it a model farm. The barns, outhouses and fences, that have been newly built, are just what they should be, neat and convenient; the garden is well kept, and stocked with thrifty trees of apples, pears, plums, and cherries, of many different varieties, as well as the currant, gooseberry, and other small fruits. As the owner is still a young man, we, who are older, can say: "You are in the right way; go ahead! When you are *ready* to build a new house, build it, and let it be a good one; but, take your time, and don't be in haste to tear down the old one."

The farm of Alpheus Wilson, on Dry Hill, Watertown, was, in some respects, better managed than any we saw elsewhere. The arrangement of his barns and sheds is admirable. Having abundance of water gushing out of springs on the hill-side, he uses it to the best advantage, leading it through pipes into his sheds and stables, so that his stock can drink at any time without leaving their feeding places. His fences are good, his land well cleared up, and on his low grounds he has some five hundred rods of open drain. All his farming implements are in first rate order, and he has plenty of them. We think, however, that if he would plow his land ten inches deep, instead of from four to six, his farm would be more productive than now.

The farm to which the second premium (the highest awarded by this committee) was given, is a farm of one hundred and seven acres, lying in

Digitized by Google

the town of Brownville, and owned by Oliver Bartholomew. About eighteen acres of this land is in wood, twenty in pasture, and eighteen in meadow. The remainder is under the plow, and in a good state of cultivation. Such crops as were not harvested, looked very well; the barns were full, and the winter rye, which had been thrashed, turned out 30½ bushels to the acre. The barns, fences, gates, and outbuildings, all the work of Mr. Bartholomew's own hands, were in good repair—some of the gates, which have been in use for many years, being as strong as when first hung. A convenient stone house, built over a first rate cellar, and finished off by himself, will last for generations. There is a very fine nursery on this farm, to which a premium would have been awarded had not a county premium been awarded to the farm. An orchard of one hundred and twenty bearing trees, showed a more vigorous growth, and more judicious care than any orchard we saw during our tour. In certain places on his farm, where the lime rock crops out and lies perfectly bare, Mr. B has set out trees in the crevices and broad seams, which, by their dark foliage, smooth bark, and luxurious shoots, tell the story of fruit-growing north of the river. One other thing we noticed while making the examination of this farm. Finding the old trees on the skirts of his wood lot dying, the careful owner checked the progress of further decay by setting out young trees on the border of his wood lot, thus preventing the sun from beating in upon the bare trunks of the old trees, which had grown to maturity in the shade of the primeval forest.

The third county premium was awarded to Ora Cooley, of Rodman. His farm has long been known as one of the most productive and best managed in the county. Having other land at a distance of three or four miles, on which his cattle range, he keeps the home farm in first rate order, with comparatively little trouble. The house is large and commodious, barns and farm buildings convenient, fences in good repair, everything on the premises, in fact, exhibiting the constant care of the owner. Mr. Cooley has made a great deal of money from that farm, and of his ample means can afford to treat it well.

There is a great improvement in the character of the farm buildings now going up throughout the county. Old barns are being moved into better positions, overhauled and re-modeled, new ones are built, and outbuildings generally wear a neater outside, and show more convenience inside than heretofore. We had intended to speak particularly on this subject, but find that our limits will not permit us to enlarge upon the notes we made of Mr. Cleveland's barn in Adams; Mr. Tibbitt's, in Rodman; Mr. Barbour's, in Philadelphia; Mr. Stuart's, in Brownville, and Mr. Alfred Coolidge's,

Digitized by Google

in Philadelphia; the latter one of the very best in its arrangements that we saw. It needed but one thing, and that we did not see in *any* place during our tour, a cess-pool, or place prepared to receive all the drainage from house and stables, and to keep under cover all the manures made on the premises. We want to see *one* stercorary, at least, in the county. On the large and well-managed farm of Abram Barbour, of Philadelphia, more attention was paid to the manuring of his lands regularly and systematically, than on any large farm we visited. The county premium was awarded to Mr. Barbour some six or seven years ago, since which time he has expended a great deal of money and labor in improving his farm, for all which he has been amply repaid by the increase of his crops. The premium for the best farm in town is awarded to Mr. Barbour.

Dairies.

We come now to speak of the dairies, and in the outset we would remark that the dairying business in the county, already immense, is rapidly increasing, and whether we look at the capital invested, the amount of labor employed, or at the excellence of the butter and cheese produced, we must regard this as the leading interest of our farming community. In view of these facts, we beg the executive committee to take into consideration the propriety of awarding to the best cheese dairy in the county, a premium second only to that for the best farm, and of increasing the premium on butter, so as to follow next in order to that of cheese. This opinion we have frequently expressed, and the dairying interests of the county seem to demand it at the hands of the Society.

As we have already taken up so much time, we can do little more than mention the names of those persons to whom premiums were awarded, and we pass by the minutiæ of the dairy with the less reluctance, from the fact of its having been so fully treated in the report of last year's committee.

To Solomon Hadsell, of Champion, the first premium on cheese was awarded; to Clift Eames, of Rutland, the second, and to David F. Snell, of Watertown, the third.

In arranging these names we had no difficulty at all, but following them were claims, so equally balanced, that we were at a loss to decide between them. As the first county premium on farms, and several town premiums remain in the hands of the treasurer, we deemed ourselves fully justified in placing on an equality, for the fourth premium, five names. A fourth premium is therefore awarded to George Webb, of Pamelia; to Phineas Hardy, of Le Roy; to Isaac Warriner, of Philadelphia; to Charles Rundlet, of Alexandria, and to Hiram Babcock, of Rutland.

The fifth premium is awarded to David Granger, of Champion; the sixth

Digitized by Google

to Erastus Whitney, of Philadelphia; the seventh to Egbert T. Allen, of Pamelia, and the eighth to Lyman Wilson, of Philadelphia.

In many of the best dairies that we visited, the cheese was made to order, for a foreign market; and though too dry and tough to suit our own taste, or even the taste of those who made it, the skill that was shown in producing perfect uniformity in the taste and touch of the entire dairy, elicited our admiration. The difference between cheese made for shipment, and that for home consumption, is so great as to be detected the instant of entering the cheese room. Such being the case, we must hereafter judge of cheese dairies by different rules, and refer them to different standards of excellence, according to the market for which they are destined.

In the butter dairies there is not the same difficulty, and in the butter market, whether at home or abroad, the rule of judging is the same: brine clear, firmness uniform, a kind of granular fracture in opposition to the salvy feel that indicates overwork, and a perfectly sweet taste. These characteristics of good butter, and all these characteristics are as strongly marked in Jefferson County butter, as in the best that Orange ever afforded. The first premium on butter was unhesitatingly awarded to the best dairy we examined, that of Amos Goulding of Le Ray. Let him who doubts our judgment buy a tub of it, and he will think as we do; or he can get one *almost* as good from Joel Brooks, Rodman, to whom the 2d premium was awarded. The 3d premium to Nathan Coolidge, of Philadelphia; the 4th to Charles L. Simmons, of Watertown; the 5th to Nicholas Yost, of Theresa, and the 6th to Richard B. Wilson, of Watertown. After we had been examining two of the best dairies that were presented, in which the best native salt is used, an old friend of the Society presented his butter for examination, to ascertain if there be a difference between butter salted with rock salt, and that salted with Syracuse salt. We think there *is* a perceptible difference between the butter of those dairies and that of Alfred Coolidge, the dairyman to whom we refer, and we are decidedly of his opinion in regard to the superiority of the imported rock salt for butter. The butter of Mr. Coolidge is unsurpassed in quality, but as he has used up and disposed of a large quantity without making any account of it, we could not compare his yield with that of others. We would recommend the award of a vol. of Transactions to Mr. Coolidge.

In making up our awards we have been governed by the *quality* of the butter and cheese in the first place, and by the *quantity* made per cow, in the second place. To the best of our ability we have done our duties, and that is all that can be expected of us. If the premium list on dairies were

Digitized by Google

larger, we could satisfy ourselves better, and if we were buying butter and cheese, we should gladly sieze on many a dairy that is not noticed in this report.

The committee have awarded but a single premium on nurseries. Edwad S. Salisbury, of Ellisburgh, the former President of the Society, has devoted much time, attention and money to the getting up of a nursery for the accomodation of such persons as desire fine fruits, and prefer those trees that are native to our own section of country. Experience and common sense both teach us that we should depend upon the nurseries of Rochester, Syracuse and Oswego, no longer than we are compelled to, or until we can obtain equally thrifty trees grown in our own neighborhood and nurtured in our own severer climates. To obviate the necessity of sending abroad for choice fruits, is the object of Mr. Salisbury, and within the last three years he has made a fair beginning, having some fifteen thousand young and healthy trees in his nursery, comprising all the approved varieties of the apple, pear, cherry, peach and smaller fruits, to say nothing of ornamental trees and shrubs. In all, there are some eighty varieties on his grounds.

In this connection, and before we close, we must be allowed to call the attention of farmers, and every other man who owns a house and yard, to the planting of trees and shrubbery about their dwellings.

If you wish to improve the appearance of your grounds, in no way can you do it so easily and effectually. If you wish to double the value of your property in the cheapest manner possible, plant trees. If you wish to obtain the largest revenue from a small quantity of land, plant the choicest fruits; and if you wish to keep cool and comfortable yourselves, plant the vine and sit beneath its grateful shade. If you would have your children love their home above all other places on the earth, plant beautiful trees, and watch, and tend, and nourish them, that they may grow with your children's growth, and strengthen with their strength, and be unto them as familiar and cherished friends.

Further still.—If you would have your children love their school, grudge not the gift of an acre of land, where the land is cheap as ours, that your school house may stand embowerd in vines and trees, and plants, and shrubs, that the young hearts of your children will learn to love and their hands to tend, under the faithful guidance of accomplished teachers. Such teachers can be found, and this is not a fancy picture. In one town of this county, something of the right spirit is showing itself in this particular. A laudable desire to make school pleasant, has prompted the erection of a tasteful and commodious house, in the Eames district of Rut-

Digitized by Google

land, the laying out of the grounds around it, and the employment of permanent faithful teachers. No visit that we made during our tour afforded us a purer gratification than did our visit to this school, short though it was.

There are other topics on which notes were made by the committee, but our time is exhausted, and perhaps the patience of our auditors. We therefore make our bow and consider ourselves discharged from further duty as a committee.

M. R. PATRICK,
STEPHEN BOON,
DANIEL PARKER,
JERRY M. CANFIELD,
MARTIN L. GRAVES.

Resolved, That the thanks of the JeffersonCounty Agricultural Society be presented to Hon. GEORGE R. FAIRBANKS, of the State of Florida, for an Essay on "*Farmers' Homes*," and that the same be published with the proceedings of the Society.

AN ESSAY ON FARMERS' HOMES.

BY HON. GEORGE R. FAIRBANKS.

In the general advancement of agricultural pursuits and improvements in the culture of the soil, while we find every thing to commend, we find cause for regret that our farmers' homes have received little or no attention. While speaking daily of home influence and home associations, how few realize what a home should be, or in what manner such influences or associations may be induced and preserved.

The migratory and homeless character of our people has been deemed by foreigners a national characteristic and by no means a favorable one. The influence of a pleasant home upon the development of youthful minds is not sufficiently heeded and for the want of such influence attaching the heart of nascent youth to the home and pursuits of childhood, we find our farmers' sons and daughters impatient of its confines, and eager to plunge into other ways of life and seeking to leave the pure and noble employment of agriculturists for the more dependent and caresome life of the town, exchanging the free enjoyments of the life giving air of heaven for the reeking and stifled atmosphere of pent up cities. A continuous improvement in agriculture cannot be expected amidst such constant changes, the valuable experience transmitted from father to son is lost and each generation must learn anew. Nor can agriculture assume the station it deserves as an employment of highest respectability so long as farmer's sons and daughters

Digitized by Google

are every where striving to enter other employments and decked in fine attire and assuming more luxurious habits, look down upon the rural pursuits of their parents.

Again, as respects the moral education of our youth, the influences of a pleasant home, when without and within, the heart finds satisfaction in the development of its aspirations for the beautiful, when the social glow of the evening fireside, and the climbing vine and sweet scented flowers, the green meadow and the waving field, the rustling corn and the ripling streams, make home the point of greatest attraction, where the lessons of truth and morality first imbibed will remain implanted and fixed with every association of home, its affections, its pleasures, and its interests.

The sense of beauty exists in every heart; but for the want of the knowledge to produce forms of beauty, our agriculturists have been content to live with homes with which, so far as art is concerned, there can be no association of comfort, beauty, or pleasantness.

Without fitness of proportion, or convenience of arrangement, thrust out upon the dusty highway, devoid of shade and barren of the beautiful foliage which nature so freely furnishes, a bold, bald, disproportionod rectangle or square, too large for a cottage, too small for a mansion, painted yellow, red, or glaring white; we cannot feel that such residences are adapted to the climate, the occupation or the convenience of the proprietor. But we would rather say a farmer's home should be withdrawn from the dusty thoroughfare, with which he has little connection, located with reference to his farm, embosomed in a shady grove, whose foliage should be a protection against the heats of summer and the blasts of winter, surrounded with an ample plat of green sward, with clumps of native forest trees, with its garden filled with fruits, and trellises covered by the vine; its plats devoted to simple flowers; roses and other hardy shrubbery, which seem to have a natural proximity to the presence of the gentler sex. That the house should be, not an imitation of some showy village mansion, with porticos and Ionic columns, or of some cocked hat cottage, all gables and no house; but should be moderate in proportion, colored with some nature-resembling tint, suited to the location in which it is placed, that its construction should evince taste and modest elegance, accompanied with no expense for mere ornament; planned within, not for useless show, with folding doors and double parlors, but every part to the convenience and comfort of its occupants; its verandas covered with flowers and fruit bearing vines—its roof projecting for protection, and its chimneys modeled with graceful forms, neatly enclosed by itself with a light paling, and a carriage-way sweeping across a lawn from

Digitized by Google

the distant highway. Its outbuildings evincing the same orderly arrangement and convenient adaptation to their various uses.

Not one of us passing by such a home but would be delighted with its cheerful, pleasant aspect, not one but would wish that his was such a home; and yet there is scarcely one who could not thus make his home worthy of his occupation. A house constructed with elegance and good taste, costs no more than one badly proportioned and badly located.

How often do we see a large stone house, costly in its construction, without anything better than a rail fence enclosure, without door-steps, with upper rooms unfurnished, and looking cheerless and desolate, when one-half of the money would have built a snug, convenient, and tasteful cottage, peeping out of its leafy screen, and denoting the good taste of its occupants.

A farmer's home, such as it should be, placed upon the thousands of beautiful farms in this county, would elevate the character and ennoble the occupation of agriculturists in the public mind, would lead to a proper appreciation of its dignity and importance, throw around the young, pleasant and cheerful associations, stop the depopulation of farming towns, and raise up an increasing class of farmers, distinguished alike by intelligence, science, good farming and good taste.

We believe no more useful or acceptable service could be rendered to the country, than a work devoted exclusively to farm houses, which should give the plans, the details and arrangements, by adaptations and modifications of which any farmer could plan and build a true farmer's home; such a work, although as yet unfurnished, it is to be hoped will be before long forthcoming from some mind capable of appreciating the wants, the desires of the culturists of the soil, and it is to draw attention to this hitherto much neglected subject, that these few hints have been thrown together.

Agricultural Education.

Extract from the address of the president of the Society, Jason Clark, Esq:

The plan for a State Agricultural School has been proposed and recommended by many whose opinions are entitled to great weight. I have no doubt but one ought to be established. The science of Agriculture may be taught as fully and as usefully as any other of the sciences, and I see no reason why the 3,719,991 persons engaged in agriculture, should not have the same facilities for receiving and imparting instruction that the other departments of our country enjoy. The 23,076 persons employed in internal navigation, 56,021 engaged on the ocean, the 65,255 in the learned professions, the 119,507 engaged in commercial pursuits, and the 791,749

Digitized by Google

engaged in manufactures, have experienced and educated men, who spend their lives in directing and instructing these different classes of individuals in their various callings, and preserving and perpetuating every useful and valuable discovery. All these different classes of men, highly intelligent and honorable as they are, amount to 1,555,608, not quite one half as many as those engaged in agriculture. Whoever looks at these figures will not deny to the agriculturists an equal privilege for improvement in this essential and indispensible branch of American industry.

The State has its Normal School—superintends our colleges, our academies, and our common schools. And there is the Military School at West Point, where the science of national defence is taught to that degree of perfection that the plains of Mexico have sent up the shout that its graduates "never surrender." But up to the present time we are without our Agricultural School. The improvements which experience has taught the farmer, and the useful and valuable discoveries made by him, are measurably lost, for the want of a proper institutiou to collect, arrange, and perpetuate them.

"Agricultural production is the first in order, the strongest in necessity, and the highest in usefulness. Still it has been neglected to be taught as a science.

Persons employed in commerce, and in the mechanical pursuits, have ever been subjected to a thorough course of instruction and regular apprenticeship, as a pre-requisite to an engagement in their respective callings, "while to know how to wield the axe, to hold the plow, and to swing the scythe, has been deemed sufficient to entitle the possessor of that knowledge to the first place and highest wages in agricultural employment."

The present is an age of progression and improvement. Science has brought to light these improvements. The present generation have witnessed the application of steam as a motive power, by sea and by land. What prudent man would dare intrust himself to be "steam driven" at sea at twenty knots per hour, and on land at forty miles per hour, if he did not know that the engine had been built by the most skilful and experienced engineer; the ship and the car built by the most approved mechanics; the railway laid down under the eye of the careful and experienced civil engineer? The light of science imparts to man a confidence, and inspires him with a courage that annihilates distance.

The son of a Boston tallow chandler was enabled, by an experiment in philosophy which his own native genius prompted, to snatch the lightning from heaven. That mysterious agent is, by the light of science, now becoming the means of communication from one end of our widely extended

Digitized by Google

country to the other, with the speed of lightning. And I am authorized by an agent of the O'Reilly line of telegraph, to announce to you to-day, that within *forty days* this place will be put in connection, by a telegraph line, with New Orleans on the south, Quebec on the north, Halifax on the east, and Fort Leavenworth on the west. The connection will be formed by a line to be constructed from Oswego to this place, and thence to Ogdensburgh, where another line is to terminate, coming in from Boston through the New England states, making the connection complete with the north and the south, the east and the west. Whilst science, and experience, and energy, and capital, and lightning, are doing these wonders in our land, let it not be said that AGRICULTURE is to be overlooked, nor should we stop short of securing for this department that enlightened policy and system of instruction which its importance demands.

LEWIS.

The Lewis County Agricultural Society held its Ninth Annual Fair in the village of Martinsburgh, on Thursday and Friday, Sept. 12th and 13th. Never since the establishment of the Society has there been so deep an interest manifested in its prosperity as upon this occasion. The advantages to be derived from this Association are worthy of all the energy and zeal that can be brought to its support.

The first day was devoted to examination of animals and articles exhibited for premiums. From the formation of our Society up to the present year, there has been a steady increase in the number of animals annually exhibited, and an improvement in the quality of the various kinds of farm stock exhibited, which reflect much credit on the farmers of our county. The ladies' department on the first day was attended in the court house. This part of our annual fair furnished, as usual, many attractions, and to this part of our exhibition are we to a considerable extent indebted for the very numerous collection of people who were present, and who, on all such occasions, seem delighted with the great variety of articles to be seen, as well as with one another.

The second day was devoted to the plowing match—after which the annual address was delivered by Hon. Caleb Lyon, of Lyonsdale. It was listened to with marked attention, and the approbation of the audience, at its close, showed that his efforts to advance the cause of Agriculture were duly appreciated.

Annual Meeting, December 20.

Premiums on field crops—Oats, eighty-two bushels per acre. Winter wheat, 28; spring wheat, 26. Indian corn, 79. Peas, 38.

Digitized by Google

Officers, 1851.—S. D. Mason, President; S. P. Mills, Recording Secretary; Harrison Barnes, Corresponding Secretary; M. M. Smith, Treasurer; eight Vice-Presidents and an Executive Committee of five.

S. P. MILLS, *Secretary*.

Extracts from the Address of Hon. Caleb Lyon, of Lyonsdale:

* * * All our grain and fruit, as well as our domestic animals, have been cultivated and naturalized for the use of man—and he has laid every clime under contribution to gratify his wants and minister to his appetites. Wheat and rye grow wild in Siberia, and on the borders of the Caspian Sea. Rice belonged to Ethiopia, buckwheat to Tartary and Thibet, Indian corn to Mexico, oats are indigenous to Russia and California, beans to China and Hindostan, peas to Sicily, beets and onions to Spain and Portugal, tomatos to Brazil, the potato to South America, cotton to Siam, melons, peppers, cucumbers and asparagus to India, ruta bagas and turnips to Sweden, the cauliflower to Turkey, the peach to Persia, the plum to Syria, the cherry to Asia Minor, the quince to Austria, the almond to Barbary, the pear to France.

The horse is a native of Circassia, Arabia and Russia; our cattle of Europe and Asia; sheep of Africa; goats of Switzerland; swine of Germany; our poultry of China and Malacca, while the turkey alone is the native-born of all our barn-yard brood. It was given the name it bears from the first impression the English had, who imported it from Spain, that it came from Turkey—whereas, the Spaniards domesticated it after the conquest of the New World. Many of these blessings to man were transmitted to us through England, who in turn received them from Holland—Holland from Italy—Italy from Greece—Greece from the East. Nor will their derivation be wondered at when it is recollected that we are indebted to the Jews for our religion—the Greeks for our amusements—and the Romans for our laws. Man's progression is thus fairly illustrated—of all created beings, *his* course alone is onward.

* * * * * * *

Permit me to call your attention to a subject intimately connected with the comfort of your homes. I would ask in what manner an acre of ground, in the common course of cultivation, can so well be employed as in a garden, or who deserves to have life's path strewn with fruit and flowers, more than the farmer. All our vegetables were originally acclimated here. Homer, who composed his great poem, the *Iliad*, five hundred years before Cadmus brought letters into Greece, makes Laertes describe, in glowing colors, the bright associations that were clustered about his truest cradle of

Digitized by Google

agriculture, and here it was that Plato discoursed—Eve sinned and Jesus prayed. The Academy, Eden, and Gethsemane, have consecrated its very name; the Elysium of the ancients was this, and nothing beyond. The Chinese have floating gardens; the Persians hanging gardens; the Arabians fountain gardens; but ours are household gardens, and often life's treasured moments may lie in the memory of the flowers plucked from thence to adorn a bridal or to grace a bier. It is the spot infancy loves the best, and no home is perfect without one, however humble it may be. It requires but little labor, and there is no acre of a farm that pays better. Its fruit ever commands a ready market, and is one of the greatest luxuries that God has given to man.

* * * * * * *

We are told that the earth is man's, and the fullness thereof; but how many there are, homeless, in this free and happy land. Legislation has now given to our farmers the advantages of securing to themselves an inalienable right to their hearthstones and their firesides, and it is fervently hoped that this exemption may answer the wise purpose that its philanthropic advocates originally intended, and with such competence the farmer may feel that there is a higher nobility than that of kings—the nobility of labor, that it is but another form of prayer in every good man's life—that the God we worship labored to create the earth upon which we dwell, that our Savior was a carpenter, and his mother the daughter of a shepherd—that society has no caste but merit, and life has no obstacles that perseverance and integrity may not overcome—that self-control destroys temptation, and self-denial beguiles success from the obdurate heart of fortune. These simple truths, ye silver-haired farmers of Lewis, have you realized. When a frowning wilderness scowled over our country, you came, a few and fearless band—your defender was your rifle, and your fortune your axe. You braved those dark days when the British cannon thundered along the shores of the St. Lawrence, and the scalping knife of the Indian was busy in our forests. With ready hands and honest hearts you laid the foundation of this county's prosperity. Years of toil were yours, years of struggles, of hopes delayed, of trials calmly borne, of sufferings and doubt—how your hearts longed for the green hills of New England that you had left astern forever, rich with the precious associations that belong alone to younger years—yearned for your homes, their comforts, and their affections. Look around you, and behold your reward.

May the dark valley be lighted by the smiles of your God, and its ruggedness smoothed by the industrious kindness of your children.

To the young farmers of Lewis I would say a few words. Be not dis-

Digitized by Google

couraged by difficulties, and let a good education be the basis of your future prospects in life. It offers to you a thousand resources in adversity, and preserves you from the folly of human pride. Let not your feet wander from the land of your youth, though tempted by the luxurious prairies of the west, or the golden sands of the Sacramento. Remember that a cold climate and a stubborn soil is favorable to the development of the physical and moral man; that Switzerland, and Scotland, and our own New England, have, amid their mists, rocks and mountains, brought human nature to its nearest perfection; that a warm climate engenders a physical as well as moral languor, from which those who once feel it seldom recover. Recollect also, that integrity, intelligence and virtue, will make you respectable and happy here—without them, you will be happy nowhere. Do you feel as if the lawyer, the merchant, and the mechanic had an easier life than yours; the crowded denizen of a village; the confined inmate of a city; recollect that each lot has its trials, perplexities and cares, and that through all ages your calling has been the one of all others, to which mankind have ever looked as a retreat from the busy cares and weariness of the world. Poets have sung its praises; painters have immortalized its picturesqueness; gods and godesses once held festivals in its honor; and so long as the seasons smile, and man multiplies and replenishes the earth, so long shall man embellish and illuminate his condition. It was his first occupation, it shall be his last employment.

Adam was a farmer; while yet in paradise, and after his fall, he was commanded to "earn his bread by the sweat of his brow." Job, the honest, upright, and patient, was a farmer, and his stern endurance has passed into a proverb; Socrates was a farmer, and he wedded to his calling the glory of his immortal philosophy; St. Mark was a farmer, and divides with Prometheus the honor of subjecting the ox for the use of man; Cincinnatus was a farmer, and the noblest Roman of them all; Burns was a farmer, and the muse found him at his plow and filled his soul with poetry; Washington was a farmer, and retired from the highest earthly station to enjoy the quiet of rural life, presenting to the world its sublimest spectacle of human greatness. To these names may be added a host of others who sought peace and repose in the cultivation of their mother earth—the enthusiastic Lafayette, the steadfast Pickering, the scholastic Jefferson, the calculating Franklin, the fiery Randolph, all found an El Dorado of consolation from life's cares and troubles, in the green fields and verdant lawns that surrounded their homesteads. Do you ask for a higher motive for your future exertion than those illustrious examples? Let it be found in your patriotism; and in view of what has been done, and what remains to be done, let

Digitized by Google

me congratulate you upon the past, and urge you to persevere for the future. Go on in the path upon which you have entered—the path of usefulness and honor. The earth is yours, with all its boundless capacities and endless resources; and their development and application will afford full scope for all your powers. No effort shall be lost, but of the increasing and exhaustless treasures of the earth, you shall be liberally rewarded.

MADISON.

By a custom in our Society, it is made a duty, of our newly elected President to report, who from the nature of the case, is minus all the general and statistical information, pertaining to the doings of the Society. As soon as I learned that duty had been left to me, I hastened to make such report, as my knowledge of the matters and general resources of the county would admit, which of itself will be an ample excuse for all defects.

It is gratifying in being able to report a good and permanent improvement in the Agricultural and Mechanical interests of the county, from last year. That there has been an improvement, steadily going on from year to year, in the cultivation of the soil; the introduction of improved breeds of stock; in the structure of farm buildings, and farm utensils; the new energy imparted to the various departments of mechanical skill, the records of the Society since its organization abundantly show. The usefulness of county organizations can no longer be doubted. But it is not in the particulars already mentioned, that the principal benefit is derived; Agricultural associations have a higher and worthier mission. It is the uniting of the hitherto seemingly separate interests of the farmer, the elevation of his profession to a position which it justly merits, not inferior to any other. The farmer may well be proud of the position he occupies, for of him it may well be said, he is "nature's truest nobleman," from his active and generous efforts flow the means by which our noble system of education and other kindred institutions are sustained. In this respect, the farmers of Madison county, have much of which they may justly be proud. Aside from their district schools, which are constantly improving in usefulness, there are academies located in almost every town, they have their University, which is justly ranked among the first literary institutions of the State; and notwithstanding the severe opposition which it has so recently encountered, which seemed to threaten its very existence, it still nobly maintains its high character, having laid its foundation broader and deeper, is now prepared to offer greater inducements than ever before, to such as shall avail themselves of its superior advantages.

Digitized by Google

The soil of Madison county is fertile, its sources of wealth abundant. It is then for the farmers of our county, to develop those resources by action and persevering industry; to avail themselves of the advantages to be derived from the experience of others, to profit by the improvements which are from year to year, made known through the medium of our county meetings, agricultural papers, and county fairs. Then will their labors be amply rewarded, their position and influence appreciated.

Our last Annual Fair, which was the "Tenth," was held at Cazenovia, on the 26th and 27th of September. The attendance was large, clearly evincing a desire on the part of all, to advance the interests of their profession and make each succeeding annual exhibition more interesting and instructive than the preceding one.

Much credit is due the enterprising citizens of Cazenovia, for their untiring efforts to make the stay of their visitants agreeable. The first day of the Fair, was devoted to the exhibition of animals and farm implements, &c. The show of cattle, horses, and indeed all kinds of stock, was strictly creditable to old Madison, in every respect equal, if not surpassing, the exhibition of any previous year. The exhibition of neat cattle was unusually fine. There were some very superior Short Horns, presented by S. P. Chapman, which took prizes at the State Fair. There were other scarcely inferior, presented by A. Morse, J. Muir, Sen., C. R. Ackley, H. P. Potter, and J. D. Ledyard, Jr., together with many grade and native animals, possessing great excellence. The show of horses answered to the fullest extent our expectations. The farmers of our county seem to give their attention more to the improvement of the kinds of stock already in their possession, rather than the introduction of foreign blood. There has, however, been a new breed of horses introduced by Ackley & Gilbert, of Hamilton, known as "Morgans," which combine in an eminent degree, strength and power of endurance with symmetry of form and great action.

But perhaps the most attractive portion of our exhibition, presenting some of the rarest specimens of artistical skill and beauty, arranged in the most skillful manner, was "*Floral Hall.*" To the arrangement of this department the ladies of Cazenovia, most kindly gave their attention, and most cheerfully, do we acknowledge, the obligations we are under for their presence and assistance.

The second day of the Fair was devoted to the plowing match, the annual address and the business transactions of the Society. The crops of this county, have not been as abundant as last year, except corn, the records of premiums show that in one instance, there was harvested 105 bushels to the acre. The plowing was not in all repects, what it has been on former occasions, principally owing to the unfavorable state of the weather; enough

Digitized by Google

was seen, however, to satisfy our minds that this branch of Agriculture, is receiving to some extent at least, the attention its importance demands. Sub-soiling is not practised to any great extent in this county; there has been a few experiments of sub-soiling in East Hamilton, which has told well. No new interest has been awakened on the subject of "draining."

The able address of the Hon. B. P. Johnson, was truly eloquent and instructive. It contained an amount of useful and practical information, rarely presented in a single address, and was listened to by a large and intelligent audience of farmers and mechanics, with marked attention and satisfaction. The funds of the Society are in good condition, as the report of the treasurer shows. We paid out $321, in cash premiums, besides many awards of Transactions and vols. of the Cultivator.

The Officers for 1851, are James H. Dunbar, President; S. P. Chapman, Vice President; Elijah Morse, 2d Vice President; Treasurer, Alpheus Morse, Eaton; Corresponding Secretary, Thomas A. Clark, Chittenango; Recording Secretary, Charles D. Miller, Peterboro.

Field Crops.

Winter Wheat—Lewis Rayner, Cazenovia, 39 bushels 12 qts. per acre.

Indian Corn—Oliver A. Benedict, Cazenovia, 105 bushels per acre.

Benjamin Enos, De Ruyter, 77 bushels 27 qts. per acre.

Oats—David Hess, Fenner, 167¾ bushels, on $2\frac{41}{100}$ acres.

Barley—Preston J. Farnam, Cazenovia, 101 bushels and 20 quarts, on 2 acres 93 rods.

Benjamin Enos, De Ruyter, 2½ acres, 86½ bushels.

David Hess, Fenner, $18\frac{2}{100}$ acres, 457 bushels.

Lewis Raynor's Statement of the cultivation of a crop of Wheat.

1st. The previous crop was barley and spring wheat, without manure of any kind.

2d. The soil a gravely loam upon clay, situated in the west part of Cazenovia, 750 feet above the Erie canal at Chittenango.

3d. There was no manure on the crop. The variety, Mediterranean winter wheat. The quantity sown was two bushels to the acre, on the 5th September, 1849.

4th. The wheat was cut the last of July, 1850, and thrashed by hand in the month of December; cleaned by a fanning-mill; measured in a sealed half-bushel, and the quantity was thirty-nine bushels and twelve quarts.

5th. The stubble of the former crop was fed by sheep until the grain was nearly all picked up. The ground was carefully plowed, the seed sown broadcast, and harrowed both ways.

Digitized by Google

6th. The expenses of cultivation, harvesting, thrashing, and cleaning, were,.....		$9 25
Interest on land,.....		3 50
		$12 75
39$\frac{12}{32}$ bushels of wheat, at $1.00 per bushel,.....	$39 37	
Straw,.....	4 00	
		43 37
In favor of crop,.....		$30 62

Statement verified by surveyor and assistants who measured the crop.

NIAGARA.

The Annual Fair of the Niagara County Agricultural Society was held at the village of Lockport, on the 2d and 3d days of October. As the weather was very unfavorable, the cattle show was not as well attended as had been anticipated, but considering the state of the weather, they turned out very well. The show of horses was very good, and did great credit to the farmers of this county, plainly showing that they are rapidly improving in this branch of their stock.

Our exhibition of oxen was also very fine, some of them surpassing any ever before exhibited in this county. The number of milch cows exhibited was not very large, owing to the fact that those intending to exhibit them lived mostly at a distance, and were prevented by the weather from being present. We had also a good display of fine and coarse wooled sheep. Nearly every kind of domestic animals were represented on the ground.

On the 3d of October, our Fair for the exhibition of agricultural implements, and domestic manufactures, was held in the basement of the Congregational church. The room, however, was entirely inadequate to the wants of the Society, in consequence of which a number declined to present their articles, having had the experience of last year. We live in hopes, however, that at no distant day, we shall have a suitable place that will satisfy the wants of the community. The display of domestic manufactures was very creditable to the ladies of this county. The agricultural implements were also very numerous, and shows an increasing interest in that department.

The receipts and expenditures of our Society are as follows the present year:

Digitized by Google

Received of members,		$212 98
do State,		93 00
		$305 98
Paid in premiums, as per vouchers, in cash,	$183 75	
Paid in incidental expenses,	25 90	
		209 65
Balance cash on hand,		$96 33
Amount of cash premiums unpaid,		$130 50
do premiums payable in books,		$62 00
do do paid do		46 00
		$16 00

Amount of books on hand, $84.00.

The first premium on wheat was awarded to Wm. Hotchkiss, of Lewiston. Product, 385¾ bushels from $6\frac{13}{100}$ acres. Average yield, 66½ bushels per acre. Expense, $112.08.

First premium on corn, to Daniel Myers, Porter, 98 bushels.

Second premium on corn, to G. S. Welton, 81 bushels.

First premium on barley, to A. Robinson, Lewiston, 41¼ bushels.

The officers for the following year are as follows:—Andrew Robinson, of Lewiston, President; Asahel Lyon, Lewiston, and A. Wilson Gardner, Royalton, Vice-Presidents; Wm. Hotchkiss, Lewiston, Secretary; Franklin Spalding, Treasurer. WALTER K. MARVIN, *Secretary.*

Statement of the farm crops, and manner of cultivation by M. C. Crapsey, of Lockport, Niagara county, N. Y.

Course and Order of Crops.

1st year, meadow; 2d, pasture; 3d, corn, with a portion of coarse manure; 4th, barley, with balance of manure; 5th, wheat.

By hoeing every 5th year, there is no necessity of summer fallowing, all noxious weeds being thus destroyed; and, by this course, the whole farm is producing some kind of valuable crop, and none lying useless and exposed to a scorching sun.

The products of my farm this year, (1850,) were as follows:

Wheat Crop.

Thirty-five acres of wheat, 1220 bushels, at $1, $1,220.

Expense of cultivation, thrashing and marketing, 57 cts. per bushel,

Digitized by Google

$695.40—including interest of land, $7 per acre. The whole plowed twice, laid up in beds about sixteen feet wide.

Corn Crop.

Twelve acres in corn, average yield 67½ bushels per acre, at 31 cts., per bushel, ... $308 28
Value of the stalks, per acre, $8.50, ... 96 00

$404 28

Expense of cultivation, per acre, $10 77
Add interest on land, per acre,.. 7 00—Total expense,..... $213 24

Most of the field plowed deep in the fall, but not cross-plowed. Balance manured in the spring, with coarse manure, and plowed once, rolled and cultivated, and planted about the 10th of May, three feet apart each way, and about five stalks in the hill; hoed once, and cultivated twice each way.

Barley Crop.

Sixteen acres in barley, plowed in the fall, after corn and wheat, sowed the last of April, two and a half bushels to the acre; dragged, cultivated and rolled. Produce:

Sixteen acres yielded 598 bushels, at 62½ cents per bushel, $373.75.

Expense of cultivation, $8.12 per acre; interest on land, $3.50 per acre, $185.92.

Meadow.

Eighteen acres, by estimate, 34 tons, at $6,..... $204 00

Expense of Making, $3 per ton, $102; interest on land, $3.50 per acre, $63=$165.

Potatoes.

One acre, 130 bushels, at 25 cents per bushel,..... $32 50
Expense of cultivation, same as the corn crop,..... $17 77

Oats.

One acre, 50 bushels, at 28 cents,..... $14 00
Expense, same as barley,..... 11 62

Recapitulation.

35	acres	wheat crop,...	$1,220 00,	expenses,	$695 40,	profits,	$524 60
12	"	corn crop,....	404 28,	"	213 24,	"	191 04
16	"	barley crop,...	373 75,	"	185 92,	"	187 83
18	"	meadow crops,.	204 00,	"	165 00,	"	39 00
1	"	potato crop,...	32 50,	"	17 77,	"	14 73
1	"	oat crop, ...	14 00,	"	11 62,	"	2 38
83	"	.....	$2,248 53,	"	$1,288 95,	"	$959 58

Digitized by Google

The improved part of the farm consists of one hundred and two acres. The value of the pasturing on the same, aside from the crops above mentioned, was $125. From this I deduct the expense of clover and timothy seed, $26, leaving a balance of $99—which, added to the above net proceeds of the farm, amounts to $1,058.58.

NIAGARA COUNTY, *ss.*

Moses C. Crapsey, of Lockport, in said county, being duly sworn, doth depose and say, that the foregoing statement is correct and true, according to the best of his knowledge, information, and belief.

M. C. CRAPSEY.

Sworn before me, this 2d day of October, 1850.

E. NEWTON, *Justice of the Peace.*

ONEIDA.

I send herewith the annual report of the Secretary of our County Society to the State Agricultural Society, for the past year, in compliance with the "act for the promotion of Agriculture," by referring to which, you will see that our Society was never in a more prosperous condition than at present. Our grounds were fenced for the first time at our late fair held in this village, and if we can judge from the receipts, I think there can be no doubt but that the experiment has proved beneficial to the interests of the Society. The following is an abstract of the receipts the past year, viz:

Balance on hand from 1849,	$634 20
Cash of State Treasurer,	255 00
Sale of tickets at Fair,	815 00
Cash for membership,	504 00
Volume Transactions sold,	1 00
	$2,209 20
Amount paid for premiums,	569 00
At winter meeting,	49 00
Purchase of tent,	250 00
Incidental expenses,	581 57
	$1,449 57
The balance in hands of treasurer,	$759 63

BENJAMIN N. HUNTINGTON, *President.*

Digitized by Google

Report of the Secretary.

In addition to the report of the President, the Secretary, L. T. Marshall, submits the published proceedings of the Fair, containing the awards of premiums, reports of committees, and the annual address, delivered by the Hon. Timothy Jenkins. The address of Mr. Jenkins was every way worthy of its distinguished author, and has been read with interest and profit, by multitudes who were deprived of the privilege of listening to it when delivered. An extract from this address is annexed.

We give an extract from the report of the committee on *matched and single horses*, of which Ira S. Hitchcock, ex-President of the Society, was chairman, which contains suggestions worthy of the attention of other societies in the State.

The committee are aware of one important defect in this report, which is a very common one in reports of this kind, and that is, neglecting to report separately upon every animal submitted for our inspection, setting forth all of his good points and also, all of his defects, and giving the reasons why certain points in the horse are considered good, and why a horse without them, must necessarily be good for nothing. It ought to be generally understood, when an animal is entered for public exhibition and for the inspection of judges, that those judges have a right, and it is, also, their duty, to publish the result of their examination, whether it be favorable or unfavorable to the animal. But your committee are aware, that such a course would in many instances, give offence to those owning the animal, and they doubt, whether exhibitors are as yet, quite prepared for such a report, as the object with some, at almost all fairs of this kind, in entering their horses, is to get a *premium* or *puff*, which shall aid them in making sale of them at a satisfactory price, and anything which might be said derogatory to their horses, would be sure to give offence. Now this ought not so to be. The great object in forming and maintaining an agricultural Society, is improvement, and to disseminate information. We conceive that a critical examination and report upon horses, would tend to give information which some who present horses, for public exhibition do not possess; for it cannot be denied that there are some horses entered for premium and for public inspection at almost all fairs in this country which never would have been seen there, had their owners been good judges of the points and qualities which constitute a valuable animal. This beautiful animal, the horse, is so much identified with our pleasure and our profit, that he has justly been the object of almost universal regard, and a *critical examination* and *judicious selection* of animals from which to breed, cannot be too strongly recommended, or too powerfully impressed upon the mind of the breeder.

Digitized by Google

In the judgment of your committee, (the result of much experience and observation) it is to the large, powerful, thorough-bred horse, that we are to look for lasting and valuable improvemet. To such horses, for instance, as old "Messenger," whose numerous progeny have been unequaled in this country for all useful purposes, and "Consternation," of the present day, who promises much towards improving our present stock. Few horses have been greatly distinguished for uncommon performances, whose pedigree could not be traced back to ancestors of thorough-bred stock. While many are decrying the blood-horse, as unworthy of patronage, they will still claim for some favorite animal, which they may chance to possess, a descent from some thorough-bred stock, as constituting his excellence—for instance, the advocates of the *Morgan* horses, claim for them that they descended from a thorough-bred English blood horse, while at the next breath, they will tell you that thorough-bred horses are good for nothing.

Officers for 1851.—President, Pliment Mattoon, Vienna; Vice Presidents, Ephraim Storrs, Trenton; Franklin A. Spencer, Westmoreland; Treasurer, Roland S. Doty, Rome; Secretary, Levi T. Marshall, Vernon; Executive Committee, Calvin Bishop, Verona; John Butterfield, Utica; Jonathan Talcott, Rome; Horace Dunbar, Camden; Henry Rhodes, Trenton; Amasa S. Newberry, Sangersfield; Oliver R. Babcock, Bridgewater; Horace H. Eastman, Marshall; Henry B. Bartlet, Paris; Horatio N. Carey, Marcy.

Premiums were awarded on field crops:

Spring Wheat, 25½ bushels per acre. Barley, 45 bushels. Oats, 84 bushels. Indian Corn, (on examining the statement of the premium crop of corn, we find that only a part of it was shelled, and the amount claimed, must of course be conjectural, it is omitted.) Buckwheat, 21½. Potatoes, one-half an acre, 161 bush. 7 lbs. Ruta Bagas, one-fourth of an acre, 228 bushels.

Extract from the address of the Hon. Timothy Jenkins:

Situate as Oneida is, in the central part of this inviting section of country, and upon the great thoroughfares which this inventive age has devised, we are enabled to receive at our doors, not only the products of our sister counties, but the fartherest east and the west, by trade and commerce, contribute both to our wants and to our wealth. But little more than a half century has gone by since this county was an unbroken forest. Now about ninety thousand inhabitants gather rich harvests from her broad fields and fertile and well-tilled soil. Manufactories, in capacity, costliness and finish of machinery, rivalling the best in the old world, send out their fabrics, and meet the tide of importation upon the seaboard. In short, productive in-

Digitized by Google

dustry—industry guided by sagacity and intelligence, industry based upon our own capital, has wrought this talismanic change, and covered the land all over with blessings. Agricultural pursuits always have and always will maintain the ascendant in this county. The business is studied as a profession; it is practiced as one of the best of vocations. It has risen above the stage of mere drudgery, and invites to the field of labor, talents that the learned professions might well be proud of; and industry and perseverance, which any country or age might well envy.

Can such an employment in such hands ever retrograde? Can the wheels of prosperity, now rolling on with speed and power, be reversed and carry us backwards? Should we relax our vigilance, shut up our school houses, turn away the teacher, and give ourselves up to sensuality? how soon! O how soon would calamity come over us as mildew, and the proud tokens of wealth and wisdom fall like the autumn leaf to decay! Why is it, that the republics which rule this continent from the Gila to Patagonia, favored by a more genial climate, and a soil not less fertile than ours, have made no advance in agricultural or mechanical pursuits for centuries? Why have Portugal, and Spain, and Italy, and Greece, and Palestine, and Egypt, given up their once fertile fields to arid wastes, and lost their enchanting names of "vineyards and gardens of the world?" It is mental inaction, not physical incapacity; it is ignorance, the parent of sloth, which there blights the vine and the corn-blade, and marks these lands of verdure and sunshine with penury and want.

With us the social compact rests upon a different basis. Our laws are the works of our own hands. Our days are not spent in vain pageantry, nor our nights in revelry. All of the various callings act in aid of each other. Thought, no less than time, is treasure; and every new invention, every useful discovery, is universal in its benefits, and raises the whole frame work of society to a higher state. We learn by degrees to take a broader view of our multiplied duties. Excesses we have; and our free inquiry sometimes tends, at first, more to pull down than build up; but all from highest to lowest, projects, theories, dogmas and systems, are soon brought to the test of reason and experience, and valued according to their capacity for benefiting our race. Thus, with the freest thought, and the greatest liberty of action consistent with a well ordered society, we, as a people, are advancing from step to step to a higher and wider field of political and social life.

Digitized by Google

ONONDAGA.

The Annual Fair of the Society was held at Syracuse, on the 10th and 11th of October, and, although the weather was unfavorable, the exhibition was one of the most encouraging ever held by the Society. The display of stock, and agricultural and horticultural productions, was of the most gratifying character, and gave evidence of the progress which is making in the county. The exhibitions in the mechanic department were of a character to do great credit to the mechanics of the county. In the dairy department, the exhibition was of an excellent character, and showed progress in this important branch of agriculture. The ladies exhibited evidences of their taste and industry, which attracted the attention of the multitude who were in attendance.

The plowing match, ever an object of interest, was well contested by ten competitors among the men, and by two boys under twenty-one years of age. The work was well done, and shows a creditable advance among our plowmen, in this important branch of farm labor.

The annual address was delivered by D. C. Le Roy, Esq., of Camillus. It was an able and interesting address. A copy was requested for publication, and the same was published and extensively circulated in the county papers.

Gen. Wool was present, as the guest of the Society, and was received with all that attention which his distinguished services entitled him to. He addressed the Society, and returned his sincere and heartfelt thanks for the kindness and courtesy extended to him.

Officers, 1851.—President, Moses D. Burnet; Vice-Presidents, Seth Hutchinson, R. Betts; Corresponding Secretary, V. J. Birdseye; Recording Secretary, E. J. Foster; Treasurer, L. W. Hall.

Extracts from the address of D. C. Le Roy, Esq.:

APPLICATION OF SCIENCE TO AGRICULTURE.

The age in which we live is characterized by improvements in every department of life. Progression is the law of humanity. The application of Science to Agriculture is the beginning of a new era in husbandry, and has laid the foundation of a system based upon clear and rational principles. Chemistry, Mineralogy, and Geology, are among the triumphs recently achieved by the human mind, and have already taught the agriculturist many useful lessons. Inquiries have been made into the causes of the fertility and barrenness of the earth, the food and nutriment of vegetables, the nature of the soil, and the best means of meliorating its condition. The

Digitized by Google

farmer, seeing an acre of corn which yields its eighty bushels, and an adjoining acre, with the same sunshine, the same atmospheric influences, and watered with the same genial showers of heaven, producing but twenty bushels, has been led to inquire, whence this difference? The analysis of science has solved the problem. The organic elements which enter into and form the cereal grains, are ascertained. The true theory of the laws of vegetable life teaches that those elements in a soluble state are taken up by the spongioles or rootlets of the plant, which by its power of assimilation converts those elements into the stem, leaves and seeds of the perfect plant. Liebig, Johnston, and others, have done much in agricultural chemistry towards reducing agriculture to the certainty of a science. Science and experience teach the farmer, that elements wanting in the soil must be supplied; elements abstracted from the soil by excessive cropping, must be restored. In short, it is as necessary for the farmer to feed his land as his team. This fact has been disregarded in some parts of Virginia, and other portions of the South, and consequent barrenness and sterility has been the result.

Scientific knowledge, admitted to be indispensible in other employments, has been thought to be of little consequence in agriculture. The previous study of years is required in other professions, before the pupil is permitted to practice; and yet, it has been supposed that every man could become a successful agriculturist without any preliminary preparation. This false idea has been one of the principal causes of the slow progress which has been made. The agriculturist requires an education which shall teach the principles useful to his art, and how to apply those principles in practice. Science has done much for the benefit of mankind. "It has lengthened life; it has mitigated pain; it has prevented disease; it has given new security to the mariner; it has spanned great rivers with bridges of form unknown to our fathers; it has guided the thunderbolt harmlessly from heaven to earth; it has lighted up the night with the splendor of day; it has extended the range of human vision; it has multiplied the power of the human muscle; it has accelerated motion; it has annihilated distance; it has facilitated intercourse, making the very air the highway of thought; it has enabled man to descend to the depths of the sea, to soar in the air, to penetrate securely into the noxious recesses of the earth, to traverse the earth in cars with the speed of the wind, and the ocean in ships which wait not for wind or tide. Surely an agency which has produced such important fruits, should not be overlooked in its application to that art upon which all others are based, upon which all others are dependent.

Digitized by Google

CHARACTERISTICS OF THE PRESENT AGE.

In the age in which we live, the predominance of the mental over the mere physical, is more marked than at any former period. The reliance upon armed force for the maintenance of right, or for purposes of conquest, is becoming a matter of secondary importance. The contest between rival nations is not to be decided by the strength of armies on the battle field; the contest is between mind and mind, bringing into action all the resources of science, the skill of diplomacy, and the tact of able statesmanship. The force of intelligence, guiding public opinion, is the mighty engine by which the wheels of modern revolutions are moved. Compare man, in his civil, political and social relations, as he stands on the vantage ground of the nineteenth century, with man in his former degradation and ignorance; take into consideration the present advantages within his reach, for the development of his mind, and who then can describe the immeasurable greatness which will mark his career at the end of the long track which humanity has yet to tread.

I have alluded to this advancement which the world is constantly making, to remind the farmer that he must not be content to merely mark time, but must *march forward* on the route to improvement, if he would have his profession keep pace with the spirit of the age.

But there are those, in this age, who are opposed to the introduction of improvement; who worship the exploded maxims and practices of the past, as though hallowed by antiquity and sanctified by age; and who are ever more ready to cry, innovation! than to aim at improvement. They tell us that in these degenerate modern times we have made no improvements; that in wisdom our ancestors were giants, compared with whom the moderns are but dwarfs. But surely we have all the advantages of the knowledge and experience of our ancestors *added* to our other acquirements, and the quaint Burton has said that a dwarf upon the back of a giant, can see *farther* than the giant. These champions of the great stand-still system, have generally but little capital invested in intellect, and what little they have, is let out at a very low rate of interest. Their annual income must be exceedingly small.

Another distinguishing feature of this age is, that in its advancement utility is ever kept in view. Hence it has been called an utilitarian age. Some have feared that this tendency of the age would lead to materialism and selfish individualism; begetting gross laxity in morality, and blunting the finer sensibilities of man's nature; that Mammon, "the least erected spirit that fell from Heaven," would become the God of his idolatry. But the natural tendency of the farmer's pursuit is calculated to foster virtue.

Digitized by Google

It is not beset with the temptation peculiar to many other callings. The mind of the farmer is occupied and pleased with his employment. As he traverses his broad acres, the volume of nature is ever open before him, with its instructive inspirations. He sees "books in the running brooks, sermons in stones, and good in everything" He hails the early birds of spring as the harbingers of hope—he scatters the seed in faith—the harvest is reaped in joy. Health, and contentment, and independence are his—the only true elements of happiness.

ONTARIO.

The morning of the first day of the Fair, October 1st, was as beautiful as one could well wish. The sun shone brightly, and the air was cool and bracing, making it just the day for such an exhibition. The people came in excellent season, and in unparalleled numbers, and we are happy to be able to add, that the dollars came into the treasury in the same way. The exhibition of stock was splendid. That of horned cattle, we are assured by competent judges, has never before been equalled in this county. Indeed, a gentleman whose opinion in such matters is law, and who was at the State Fair at Albany, says that it was quite as good as upon that occasion. There were three ox teams, of ten yoke each, from Farmington, East Bloomfield, and Canandaigua, and they made a magnificent appearance. Each yoke deserved a premium. Among the cattle were a yoke of two year old steers, belonging to Mr. Gates, of Hopewell, and also ten yearling steers, the property of Mr. B. T. Case, of Bristol, all of the same size and color, which were very much admired. The show of swine and sheep was good. That of poultry was extremely fine. Prominent amongst the latter was the lot raised and owned by Mr. E. M. Bradley, of East Bloomfield, which included two huge turkeys, arrayed in pure white throughout, as though adorned for a marriage feast. Mr. Charles Barker, of this place, also showed a lot of excellent Poland hens.

The show of horses in the afternoon was unparalleled in this county, both as regards numbers and quality. A fine, dappled, Norman stallion, belonging to Mr. D. L. Clark, of Gorham, Mr. Morgan's large bay team, and Dr. Carr's splendid span of black mares, particularly attracted attention.

The exhibition of articles at the court house was large and interesting. Messrs. Silsbee, Buckley & Bennet, of Geneva, exhibited a lot of cabinet ware, which we have never seen surpassed, and Mr. Howe, the former principal of our academy, a wheeled cultivat r, pronounced by practical farmers

Digitized by Google

far superior to anything of the kind heretofore invented. The plowing match went off finely.

At 3 o'clock, P. M., the Society was called to order by its President, Hon. John Greig, when Prof. J. P. Norton, of Yale College, delivered his address. It was well received, and fully sustained the Professor's great reputation. An extract accompanies this report.

After the delivery of the address, the Society proceeded to the election of officers, when the following gentlemen were unanimously chosen, viz:

Hon. John Greig, Canandaigua, President: Elias Cost, Phelps; Joseph Fellows, Seneca; Joel S. Hart, Hopewell; David Pickett, Gorham; Hiram Ashley, Richmond, Vice Presidents: Oliver Phelps, Canandaigua, Corresponding Secretary: Elisha M. Bradley, East Bloomfield, Recording Secretary: Myron H. Clark, Canandaigua, Treasurer.

Farm Crops.

E. M. Bradley, East Bloomfield, Winter Wheat, 45 *bushels per acre.*

EXTRACT FROM PROF. NORTON'S ADDRESS.

What is the education farmers ought to receive?

Prof. N. inquired, What is the character of the education which farmers ought to receive, and how is it to be obtained? I have mentioned certain evils as likely to result from a purely practical education upon home farms. Some have proposed manual labor schools, where the most approved practice could be taught, and these are certainly a step in advance; they have, however, failed, in many cases, to realize the expectations of the community, for the want of one thing, and that is scientific instruction properly connected with the practical.

The point is, in my judgment, quite impracticable, and yet I am aware that it is just here that I may come across the judgment of my hearers; many practical men are apt to look shyly and suspiciously at this name of science, and to at once imagine their boys losing all of their own hard earnings in some absurd chemical experiments, or in running about the country to pick up stones, and give them long names. In order to prove that this is not necessarily the case, and that such fears are groundless, I will first attempt to show briefly, certain points in which the various branches of science are really applicable to practical agriculture, and then proceed to suggest some ideas connected with actual instruction in these branches.

CHEMISTRY is, as it seems to me, clearly the leading science connected with agriculture. This science has, in numerous departments, already effected so much for the benefit of the practical man, that I am almost at a loss in endeavoring to select some instances of its usefulness. Its province

Digitized by Google

embraces the composition of the soil, of plants, of animals. of the atmosphere, and of water, together with the study of the changes and transformations which are continually going on among them.

By chemical analysis, we are able to separate and estimate the various substances, which compose any of the bodies that we see around us. Thus we can take the soil, and by means of various processes we can not only find what it contains, but can weigh each substance by itself, and ascertain its proportion to the whole weight. Here is clearly an important operation. By analyzing a number of very fertile soils, and of very barren ones, we are able to perceive what are the differences between them. This evidently enables us to decide by what course the barren soil may be most easily and economically improved.

We can also analyze the plant, and ascertain the nature of its connexion with the earth; by comparing its compositions, and that of any given soil, we can say what that soil needs, to make it grow any particular crop, and add it in the cheapest form. The same plan may pursued with the animal; having determined by means of analysis the composition of its various parts, we can decide what food is most valuable for special purposes. We can also, by the same means, pronounce upon the value of manures, so as to say with perfect certainty, which is most valuable, and what will be its peculiar effects.

These are all fields of evident importance, in fact they can scarcely be over-estimated, and yet they embrace only a part of what chemistry has done, and is doing, for Agriculture. Let any farmer consider what would be the advantage to himself, of knowing with certainty the composition of his soil, of his crops, his animals, and manures, and he will not venture to assert that chemistry is unimportant in its applications to his profession; it is in fact the key to it all, and we only wonder how farmers have ever been content without it, and that the truths which it is now unfolding, have not been developed before.

Next to chemistry, are two other important sciences, which in their practical bearings are closely connected with it: these are GEOLOGY and MINERALOGY. They have to do with the rocks and minerals which constitute the surface of the earth. Geology shows us that the rocks occur in regular succession, one above another. So that if we find a particular rock between two others, one above and the other below, that rock will be in the same relative position when we find it on the surface again, whether this be in America, Asia, Europe or Africa. Geologists have different but very certain ways of recognizing the various strata, and hence are able to decide many very important questions. A competent geologist, for instance, can say

Digitized by Google

with regard to any particular point in this State, whether the rocks which contain the saline springs that furnish such immense quantities of brine at Syracuse, and elsewhere, are to be found below by boring, and at about what depth; or can tell whether shafts for coal, may be sunk with any prospect of success.

Such is the province of Geology; it names and classifies the rocks, and then Mineralogy selects the particular minerals which compose each rock. Finally, chemistry comes in again, and ascertains what are the constituents of these minerals. The soil is formed by the gradual crumbling down and decay of the various rocks, hence if we know the composition of these by the foregoing means, we can evidently say with confidence, what will be the general character of the soils derived from them. Such knowledge is clearly of much advantage in surveying and determining the value of a country. By means of it, maps are made, which may serve as useful general guides to the settler. A person acquainted with the subject, can make up his mind almost at once, as to the properties, excellencies, or probable deficiencies of any tract of land. * * * * * *

BOTANY and VEGETABLE PHYSIOLOGY are also inseparably connected, and are in most of their relations, of much importance to the farmer. The first divides up all of the vegetation that exists, into classes and species, by means of certain external characteristics. * * *

Vegetable Physiology has to do with the structure, mode of growth, and properties of plants as a whole, and in their various parts. We should probably be able to throw a much more satisfactory light upon the potato disease, were we so far advanced in this science as to understand every minute change, which takes place in each part, during the whole period of growth. With what we do know already, we have been enabled to decide in what part of the plant the disease commences, and determine many of its characteristics. * * * * * *

ANIMAL PHYSIOLOGY is of equal importance with regard to our knowledge of the animal in its various parts, and of the modes in which it receives its nutriment. * * * * * * *

Professor Norton also alluded as, directly connected with these sciences, to ZOOLOGY and VETERINARY SURGERY. The first has reference to the different races of animals, dividing them into classes, as Botany does in the case of plants. The other is a branch of medicine very important but greatly neglected. * * * * *

METEOROLOGY is a science which has to do with the various phenomena of the atmosphere, and is interesting and useful to the agriculturist.

Digitized by Google

Entomology is a science relating to insects, which is a very important subject, and interesting to the farmer.

Professor N., after extending his remarks in relation to the particular application to agriculture of the sciences referred to, says:

If a man understood each one of these subjects, and was moreover industrious and practical, does any person suppose that his land would run down continually, and his crops grow poorer and poorer, as is the case on so many farms in our country. Would he not, on the contrary, be able to call into action resources that less educated men could never of themselves have discovered.

My sketch of the application of these sciences, has been of necessity hasty and imperfect; did time permit, each one might be taken up separately, and incontrovertible proof of its utility be offered; but I think what has been already said is sufficient to show that the farmer does really need them all, and can derive benefit from their pursuit.

But it may be still objected, "how are we to learn all of these things?" It is quite evident that the range taken by all of these sciences is so extensive, as to render it impossible for any one man to traverse the whole of it, even if he does nothing else; how much more beyond the scope of the farmer, who has in addition the care of land, crops, and stock? I admit the justice of these objections, and say farther, that if my propositions involved the necessity, that every farmer should become also a scientific man, that they would not be worthy of a moment's consideration, but they do not involve any such necessity. I have only said, that all of the sciences which have been enumerated, are calculated to be of direct practical benefit to the farmer when properly employed; there is not even a hint in this, that he is expected to become a chemist, geologist, mineralogist, botanist, or entomologist; each of these fields must be in the main, left to those whose particular business it is to occupy them.

The farmer, however, may acquaint himself with the leading principles of these sciences; may progress so far in the study of them combined, as to be fully aware of their value, and at the same time be able to understand and employ for his own advantage, the discoveries and explanations of scientific men.

The great principles involved in the applications of science to agriculture, are such as may be comprehended by any one of moderate capacity, and these principles are of the most directly useful nature. No man for instance, who knew something of the leading points in the applications of chemistry to farming, would ever fail to see that cropping with wheat year after year, without manure, and without change, was not only destructive,

Digitized by Google

but the poorest possible economy; or that in feeding his stock on a bleak exposed hill side, he was using up the greater part of that food in keeping them warm, which would otherwise have gone to the increase of their bodies. No man who had studied the general principles of grology, would attempt to pursue the same system of cultivation on a soil formed from the granite rocks, as upon one from the limestone rocks.

It really seems to me that there is nothing very formidable or impracticable, in the idea of indoctrinating all of our young farmers as they grow up, with the true principles of scientific agriculture. They could just as readily become familiar with them as with geography or arithmetic, and would be far more interested in such a study than in any other. * * *

ORANGE.

The Annual Cattle Show and Fair of the Orange County Agricultural Society for the year 1850, was held at the village of Montgomery, on the 18th and 19th of September. As usual a very large number of people were in attendance, showing that the citizens of the county feel a lively interest in the advancement of agriculture. The Society was never in a more flourishing condition, and its friends are encouraged by the belief, that it is every year increasing in strength and durability, and extending its usefulness.

The first day was devoted to the exhibition of articles and animals, and the examination thereof by the judges. The premium list had been prepared in the month of June preceding, and was frequently published in all the county papers, in consequence of which there was a spirited competition for most of the premiums offered. A large number of working oxen were entered, which on examination were found to be of the highest grade, and it is believed that the show in this line would be equal to that of any other county in the State. The fat cattle, though not so numerous as on former occasions, were of an exceeding good quality, among which were two extra heifers, fatted by Seely C. Roe, of Chester. The exhibition of other neat cattle was highly creditable to their owners, and showed an increasing public spirit on the part of our farmers to improve their stock. The sheep and swine were few in number compared with former fairs, though they were not inferior in point of excellence. The show, however, in this respect was no indication of the attention which is paid to that important branch of farming, by the people of the county. A large number of horses were on the ground, which, if we may judge from the attention paid them by the spectators, were of no secondary merit.

Digitized by Google

The display of agricultural products evinced a great improvement in this department, since the formation of the Society. The grain, vegetables, grass seeds, and garden products were of a superior quality, and formed an interesting exhibition.

A partial idea of the agricultural prosperity of the county may be formed from the following extract from the award of premiums :

Hamilton Morrison, best acre of rye, 47½ bushels.
Henry Wykoff, do wheat, 42 do
Samuel K. Seybold, do corn, 108$\frac{29}{32}$ bushels.
Harvey D. Copley, 2d do corn, 103$\frac{16}{32}$ do
Hamilton Morrison, best one-fourth acre of potatoes, 65 bushels.
A. M. Sherman, 2d do do 54 do

The statements of the manner of raising the crops are not sent with this report, believing they would fill too much space in the Society's Transactions, but they will be furnished if requested. The manner of cultivation is not, however, much different from that usually pursued by farmers throughout this section of country.

The exhibition of fruits and flowers was one of unusual interest, and the specimens presented it is thought would compare favorably with those of any other county. The show of household manufactures fully proved that the ladies are awaking to the importance of improving the domestic arts, both in workmanship and beauty. Implements were few ; some however, were brought from other counties.

The second day of the Fair was devoted to the plowing match in the forenoon, which was well attended, and carried on with skill and spirit. Ten teams entered the field, and the work was well performed in the time required. Among the competitors was the president of the Society, who held his own plow, and bore off one of the premiums.

In the afternoon, the annual address was delivered by the president, after which the awards of the judges were read, and the premiums paid.

The officers elected for the ensuing year are Edward L. Welling, of Warwick, President, and one Vice-President from each of the sixteen towns, an Executive Committee of five, viz: George M. Grier, Goshen ; Gideon Pelton, Montgomery ; Samuel K. Seybold, Crawford ; Alexander Wright, Chester ; William Murray, Walkill : David F. Gidney, Goshen, Treasurer : Benjamin F. Dunning, Goshen, Recording Secretary : William F. Sharp, Goshen, Corresponding Secretary.

The finances of the Society are in a very flourishing condition, thus enabling it to enlarge its premiums, and secure a greater competition.

HAMILTON MORRISON, *Corresponding Sec.*

Digitized by Google

ORLEANS.

The Annual Fair of the Orleans Agricultural Society, for the year one thousand eight hundred and fifty, was held at Albion, on Thursday and Friday, the twenty-sixth and twenty-seventh days of September. The weather was rather unfavorable, but the number of persons in attendance was greater than on any former occasion; and the show of stock of all kinds, farming implements, household manufactures, and miscellaneous articles, came fully up to the average of our former exhibitions.

On the second day, the plowing match came off, and it was well sustained. This annual contest of science and skill imparts additional interest every year to our exhibition.

The premiums were awarded, and the officers chosen for the ensuing year. The Hon. Lyman Bates, who has held the office of President for a number of years, and faithfully performed its duties, declined a re-election, and Asahel Byington was chosen in his stead. The Secretaries and Treasurer were continued in office. Not having a list at hand, I am unable to state whether there was any change of the Vice-Presidents or not.

It is hardly necessary to say, that the subject of agriculture and agricultural improvement is taking deeper hold upon the farmers of Orleans county every succeeding year. This is evinced by the increasing interest in and attendance at our Annual Fairs, as well as by the marked improvement to be observed in the appearance of the farms throughout the county; the average of crops is higher, from year to year; there is more care bestowed in the breeding and rearing of stock; choice fruits are taking the place of the uncultivated varieties; improved farming implements are generally used; more attention is paid to the proper rotation of crops; subsoil plowing and drainage are beginning to come in use; agricultural papers are quite generally taken; and, in fact, every department of husbandry, and everything that has a tendency to improve and expand the great farming interest of the county, has steadily and rapidly advanced since the formation of our county society. Much of this improvement must be attributed to the progressive character of the age in which we live; but the most of it has its origin in the thorough organization and faithful administration of the State Society, with its Annual Fairs, and annual volume of Transactions—the one, bringing together the richest specimens of the agricultural wealth, the domestic skill, and mechanical ingenuity of the Empire State, from its remotest corners, and exposing them to the examination of assembled thousands—the other, sending back to every hamlet, and diffusing to the extremities of the State a daguerreotype of the festival, carrying the Fair to the fireside of the farmer, so that he can sit down at his leisure and

Digitized by Google

examine the show in all its details; read the addresses, and the discussions of the farmers' clubs, criticise the proceedings of the County Societies, and compare his own experience and observation with the recorded experiments and experience of others. It is thus, that the spirit of investigation and emulation is awakened, and the public mind is led into new channels of thought. I believe that more progress has been made in the State of New-York, within the last ten years, in all that pertains to the true interests of the farmer, than has ever been done before in any half century since the discovery and settlement of the country.

Allow me to suggest, in this communication, the propriety of two Annual Fairs—the one in the eastern, and the other in the western part of the State. I believe it would very much increase the number who would attend, and in this manner increase the benefits derived from the annual exhibition. If this cannot be effected, then let the Fair be held at a later time in the fall—say the middle or latter part of September. This would enable the farmers of Western New-York to finish the sowing of their wheat before the Fair, and they could leave home with less inconvenience. Fall crops and fall and winter fruits would be better matured, and more and better specimens would be exhibited. I have thrown out these hints, in the hope that some one whose opinion is entitled to more consideration than mine, would look into the matter.

Yours, respectfully,

B. L. BESSAC, *Cor. Sec'y.*

Albion, January 11, 1851.

OSWEGO.

In making the annual return of the condition of the Agricultural interests of this county, there is much satisfaction in being able to state, that the prospects were never so bright for a steady progress in all its branches. At no former annual exhibition, notwithstanding the most forbidding state of the weather, has there been so general an attendance, so extensive a show on the ground, or so large pecuniary receipts.

The days appropriated to the Fair, which was held at New Haven, were Wednesday and Thursday, the 25th and 26th of September, and on both, the rain fell almost without cessation. Nevertheless, it is computed that there were present not less than fifteen hundred persons, with a general presence of the committees; nor was the interest in what was transpiring at all damped by constant showers.

The number of members who joined the Society exceeded that of any

Digitized by Google

previous year, and was very nearly sixty per cent. greater than the average of the four preceding meetings.

The preparations made, in the erection of a Hall for the reception of mechanical, vegetable, and other productions, which was done at the expense of some of the citizens of the village, afforded great comfort and convenience to the visitors.

There were on the ground, and entered for competition, fifty-seven horses, seventy-five head of cattle, twenty-five sheep, and thirty-eight swine, with a respectable show of handiwork and a very creditable as well as large exhibition of fruit, vegetables, and products of the dairy.

Among the horses was a remarkably fine stallion of the pure Norman breed, introduced during the past year from Canada; also, some thorough bred Leicester sheep, of great size and beauty; with a thorough bred and improved Short Horn Durham calf, also secured for the benefit of the stock in this county.

The amount of premiums paid was $243, being larger than on any former occasion, and general satisfaction prevailed among the exhibitors, as the committees discharged their duties with fidelity.

As this county has, confessedly, heretofore occupied an agricultural position inferior to either of those adjoining it, owing to two operating causes: one, the large tracts of timbered land, owned by non-residents; and, second, the inducements held out to the farmers to appropriate a large portion of their time to the manufacture of flour barrels. It is gratifying, however, to record a decided change for the better, in both respects.

It must be conceded, too, that too low an estimate has been put on the capabilities of this county for husbandry. Coldness of soil, as well as of climate, has been attributed to it; added to the fact that it belongs to the sandstone region, with general prevalence of hard pan, frequently near the surface. It has therefore been regarded, as illy adapted to the cultivation of grain crops. To all this has been added the apparent evil of *superficial culture*, arising from the disproportion between the extent of the farm and the means of the husbandman. There is abundant evidence to show, that in point of climate, strength of soil, or facility of cultivation, this county is excelled by very few, if any, in the State. For the growth of Indian corn, or the grasses, two of the most lucrative branches of husbandry, it may compete with any other. For grazing purposes, when properly prepared, the land in this county, in the vicinity of Lake Ontario, has no superior.

The influence of that great body of water on the atmosphere, protracts the fall feed into December, and so, materially shortens the period for housing and feeding stock.

Digitized by Google

So soon as the farmers in this region shall give their *undivided* attention to the same thorough, systematic cultivation of their farms, as is bestowed in Onondaga, Cayuga, Seneca, and Ontario; Oswego will exhibit a fertility, and a thrift, second to neither of those mentioned. It is deemed proper to make this allusion in this report, to correct, as far as may be, prevailing opinions, prejudicial to our true condition, and to bring home to our resident farmers the conviction that the "crock of gold," is yet to be found in some nook of their farms.

On the second day of the Fair, an address was delivered in the hall erected for mechanical productions, by the President, at which the attendance and attention was very satisfactory.

The subject was, the rise, progress, and influence of Agriculture; giving a rapid view of its early history; showing the dignified character of the pursuit, in every age, and urging the importance of establishing a public institution, under the fostering care of the State, for the due education of those destined to till its soil, and raise the standard of culture to a point adequate to counteract the operation of bringing the cheap lands of the west, by means of canals and railroads, to our very borders; which is only to be done by the application of *scientific husbandry* to our more costly lands. Two considerations were strenuously urged on the attention of the auditors. First, the *importance of diffusing agricultural information* by the perusal of agricultural periodicals, and the formation and sustaining of local Farmer's Clubs; and second the expediency of reducing the surface cultivated, to correspond with the resources of the cultivator, so as to secure the greatest yield therefrom, illustrating this point by numerical statements of the results of the different modes of cultivation, proving the superior advantages of thorough culture.

HAMILTON MURRAY, *President.*

OTSEGO.

The Annual Fair and Exhibition of the Otsego County Agricultural Society was held on the 24th and 25th of September. In our last year's report we said that our expectations had been much more than realized, and we thought at that time that Otsego county never could get up a better exhibition than we then had. At our last annual meeting our Society thought proper to hold out still greater inducements than they before had done, by calling in all classes of mechanics, merchants, and tradesmen to their aid, succeeded in making out a new list of premiums, and increasing the whole nearly one-third, so that the amount offered for premi-

Digitized by Google

ums amounted to about five hundred dollars, when they generally have not exceeded three hundred. The result has been favorable, and we have had as good an exhibition this fall, on the whole, as the one of last fall, and we have as readily raised our funds for five hundred dollars, as we did last year for three hundred. This shows an increased feeling in the minds of the citizens generally of Otsego county. That there is need of higher attainments in the professions they severally occupy, is now more readily acknowledged, and a greater desire for advancement is manifest in all branches of industry. We see no good reason why the farmers of Otsego county should retrograde; but every good reason that they may still advance in the good cause in which they are enlisted.

As you have made some inquiry as to local or town societies, and their effect, I would notice that we have one in our county. The southern towns of the county, known as the Butternuts, and some two or three towns adjoining, have an organization of this kind, and there is no question, in my mind, that it is an injury to our County Society, from the fact that some of the wealthiest farmers in the State reside in this locality, and are the main instruments in keeping up this local society. Whereas, if these gentlemen farmers were attached to the County Society, their influence and their help would be of great benefit, and would add to an increase of members, and draw in for competition some of the best stock in the State, which if we had at our Annual Exhibition, would add nearly one half. But, notwithstanding this drawback from the Society, we are on the increase as to numbers every year, and I think there is every prospect of still greater numbers being added.

The first day of our Fair, we had more than the usual number of mechanical implements on exhibition, and some brought in from other counties. Among them was the Michigan sod and subsoil plow, exhibited by the proprietor, Mr. Newel French, of Rome, N. Y., one of which I have used some this fall, and it works admirably, although I think the proprietors will find it necessary to increase the strength of the forward share, in order to have it stand in heavy, stony land. Should this plow once become in use, and the farmers get in the habit of plowing deeper, as reason teaches them they should, this plow must gain a reputation as one of the best now in use for our heavy and tenacious soils.

The second day of our Fair was occupied in the plowing match. The competitors were not as many as last year, although the plowing was performed much better. After the plowing match, the farmers and citizens repaired to the court house, and listened to an address delivered by B. P. Johnson, Esq., Secretary of State Ag. Society, which was good, and to the

Digitized by Google

purpose, and all united in saying they were better prepared to increase their zeal in this cause after having listened to this devoted friend of agriculture; and I have only to say if any county society gets in the way of backsliding, only secure the services of this gentleman, and let him understand your situation, and he will put you on the right track, provided you follow out his instructions.

Dec. 21st, 1850.—We have this day held our annual meeting. The competition in fruit was better than ever we have had, also in field crops, and we have taken measures to procure a tent for our next exhibition.

I was much surprised that our Legislature, at its last session, did not carry through the bill to establish an Agricultural School and an Experimental Farm. Why is it that our members are so loth to enter into this work, after so many repeated recommendations from our Executive, and the overwhelming calls from that portion of the community which so much needs, and in justice are entitled to an appropriation of this kind? Who, I ask, is the man that pays his taxes up to *par* value with the farmer, and who or what class can with more propriety ask this appropriation from the Legislature of this State? I hope renewed exertions will be made at this session to accomplish this object, which in my judgment will be of vast interest to all classes of industry, and more particularly to the agriculturist.

J. W. BALL, *President*.

Fiela Crops.

Indian Corn—Joseph Russell, Hartwick, 96 bushels, 41 lbs per acre.

Peas—Joseph W. Ball, Schuylers Lake, 34 bushels per acre.

Oats—Joseph Russell, Hartwick, 45 bushels per acre.

William C. Davison, Hartwick, 40 bushels per acre.

Receipts and Expenditures.

Balance in treasury,	$154 22
Received from members	181 00
From State	148 00
Subscriptions,	20 71
Transactions	40 00
	$543 93

Premiums paid,	$362 75
Expenses printing and diplomas,	33 29
In treasury,	147 89
	$543 93

Digitized by Google

Officers for 1851.—William Davison, President; Gustavus White, 1st Vice President; Henry J. Bowers, 2d do.; John W. Tunnicliff, 3d do.; Seth Doubleday, Treasurer; Charles McLean, Secretary. Executive Committee—Joseph W. Ball, Wm. A. Walker, John Devendorf, Williams Rathbun, Homer Colman, O. C. Chamberlin, Russell Warren, James Gilchrist, Elizur S. Smith, John Sutherland, Caleb Thayer, Joseph Russell, Alexander H. Clark, Charles Gilchrist, Alexander Taylor, Abijah Barnum, Edwin S. Coffin, Moses Wheeler.

Indian Corn.

Joseph Russell's statement.—Soil, gravelly upland loam. For several years had been in meadow. Plowed once in April, eight inches deep. Harrowed four times before planting. Marked three feet one way. Planted 10th of May, eighteen inches in the row, averaging four kernels in the hill. Put on a small handfull of house ashes on each hill as soon as the corn was up. Cultivator used twice before hoeing, cut up the weeds and stirred the corn the first time, and after the second time of using cultivator, hoed the corn, making small flat hills.

Yield 96 bushels, 41 lbs., as weighed at the mill, when sold, at 50 cents per bushel,		$48 38
Stalks,		5 00
		$53 38
Expense of cultivation,	$21 88	
Interest on land,	7 00	
		$28 88
Balance in favor of crop,		$24 50

Peas.

J. W. Ball.—Soil, gravel loam, previous crop corn, plowed the fall previous, 20 loads barn-yard manure on corn crop, spread on the furrow and dragged in. Variety, the dwarf marrowfat. This is considered a very excellent field pea, not so liable to lodge and mildew as the marrowfat, and is quite equal in flavor.

Yield 34 bushels per acre, worth $1 per bushel		$34 00
Expense of cultivation,	$10 40	
Interest on land,	2 40	
		$12 80
Balance on crops,		$21 20

Digitized by Google

QUEENS.

The Ninth Annual Exhibition of this Society was held at Hempstead, on the 3d of October. It was highly creditable to the county and to the Society, and was numerously attended by our own citizens and many from the adjoining counties.

The show of stock was in some parts very good, and some of the horses were such as would sustain the high reputation of the island. Of seed grains there was a good show, and many fine specimens. The display of vegetables was both large and very fine, several farmers having large collections of the choicest kinds.

Although there was less fruit on Long Island than at any season remembered by our fruit growers, still the show and exhibition was very fair.

The display of butter was large, and the specimens all good. It was divided into two classes. That made by girls under twenty-one years of age, and that made by those older.

A charge was made of twelve cents for entrance to the tent only, in which were the fruits, flowers, vegetables, &c., and enough was collected in that way to pay expenses and aid the Society. We think we have great cause for encouragement. The result of our labors is perceptible in many cases. We find an increased interest in the cause, and much more attention paid to improvements. Many farmers at our exhibitions obtain new and choice varieties of seeds and grains, and improved implements. We scatter about many valuable books and papers, and they in most cases stimulate inquiry, if nothing more. Very many of our young men are much interested in agricultural improvements, and the result may be seen in the management of their farms.

The moral effect of so many of both sexes uniting and passing a day in forming new and renewing old associations, must be of the happiest nature. Our people need a holiday, and agricultural exhibitions are almost the only excuse to get the farmer from his work. They are always orderly and remarkable for the kind spirit that prevails.

The conversation of so many farmers, each telling his experience, his success and failure, is of profit enough to induce us to keep our organization up, and the moral effects are sufficient to awaken a far more general interest in success than has yet been evinced anywhere.

Officers for 1851.—President, John A. King, Jamaica; Secretary, John Harold, Hempstead.

Digitized by Google

RENSSELAER.

In pursuance of the statute providing for the organization of State and County Agricultural Societies, the executive committee of the Rensselaer County Agricultural Society submit the following report:

After the Annual Meeting, which was held in February, 1850, the executive committee convened and revised their premium list, materially altering and increasing the same, from $1,550, of the previous year, to about the sum of $1,900.

During the year, additions were made to the permanent buildings on the Fair grounds, for the accommodation of exhibitors at the Fair, and the security ef articles exhibited, which involved an expense of $533.07. This sum, added to that already expended for this purpose, makes an amount of $2,824.57, for permanent fixtures.

The Society held its Annual Cattle Show and Fair on the 24th, 25th, 26th and 27th of September. The three first days were devoted to the business of the Society proper, and the last to an exhibition and trial of the power and capacity of fire engines. The exhibition was, in almost all its various departments, highly gratifying to the friends of improvement, excelling any of our County Fairs which have preceded it.

A plowing match was held on the morning of the third day, immediately after which, an able and interesting address was delivered upon the ground by B. Franklin Green, Esq., Principal of the Rensselaer Institute.

Premiums were then awarded by the several judges appointed for that purpose, amounting to $1,269, as follows:

Premiums on Farms,	$55 00
" Cattle, and 15 vols. of Transactions.	263 00
" Horses,	73 00
" Sheep,	79 00
" Swine,	52 00
" Farm Implements, and 12 Diplomas.	60 00
" Household products,	56 00
" Butter, and 1 vol. Transactions.	12 00
" Cheese, and 1 vol. Transactions.	12 00
" Garden Vegetables,	35 00
" Fruit,	44 00

Digitized by Google

Premiums on Flowers, and 2 Diplomas.	62 00
" Bees and Bee Hives,	8 00
" Ladies department, and 6 Diplomas.	99 00
" Mechanical department, and 27 Diplomas.	97 00
" Stoves, and 4 vols. Transactions and 8 Diplomas.	20 00
" Music department, and 2 Diplomas.	8 00
" Poultry, and 1 Diploma.	8 00
" Non-enumerated articles, and 12 vols. Transactions and 42 Diplomas.	128 00
" Plowing match,	23 00
" Fire department,	75 00
" Winter crops, last year,	111 00
" Young stock, 2 Diplomas.	
Amounting to	$1,380 00

The receipts of the treasury, from all sources, since the last annual meeting, have been as follows, viz:

Balance of last year's account,	$240 65
Amount received from annual members,	584 00
Amount received from life members,	40 00
Rent of booths and stands for sale of refreshments,	163 00
Sale of gate tickets,	1,099 48
Amount received from the Treasurer of the State of N. York,	180 00
Donation from Mr. Knickerbocker,	2 00
Sale of Transactions,	3 75
Avails of Treasurer's note, due the first day of October next,	350 00
	$2,662 88

The whole amount of disbursements, since the last annual report, is—

Cash for premiums,	$1,278 00
Cash paid B. Hancock, for buildings, repairs, &c.,	533 07
Miscellaneous expenses,	767 22
Cash on hand,	84 59
	$2,662 88

Digitized by Google

Amount of premiums unpaid is	$180 00
Amount due from the Treasurer of the State of New-York, ..	180 00

There was also awarded at the late Fair as premiums to competitors 35 volumes of Transactions and 100 Diplomas.

There are at the present time 537 resident members of the Society :— 229 reside in Troy; 54 in Schaghticoke: 54 in Lansingburgh; 53 in Brunswick; 44 in Pittstown; 32 in Greenbush; 16 in Sandlake; 15 in Hoosick; 9 in Poestenkill; 7 in Schodack; 6 in Berlin; 6 in Stephentown; 4 in Grafton; 4 in Petersburgh; 4 in Nassau.

The city of Troy, and five of the towns, have each more resident members than they had last year. Seven towns have each a smaller number of members than they had last year. Two towns have each the same number of members as last year, viz :—Troy has 3 more; Stephentown, 5; Sandlake, 3; Grafton, 2; Pittstown, 1; Nassau, 1. Hoosic has 35 less; Lansingburgh, 18; Greenbush, 16; Schodack, 5; Schaghticoke, 2; Poestenkill, 2; and Brunswick, 1. Berlin and Petersburgh have each the same number as last year.

Amount of premiums awarded at the last annual meeting, was	$ 111 00
Amount awarded at the last Annual Fair,.....	1,269 00
Whole amount of premiums awarded since last annual report,	$1,380 00

The premiums awarded at the annual meeting, amounted to the sum of $75, and were given on winter crops, as follows:

H. Herrington, from the committee, on wheat, rye, barley, and peas, reported an award of the first premium on wheat to B. K. Bryan, of Schaghticoke, who raised, on two acres and fourteen rods, sixty bushels, $\frac{17}{56}$ lbs., good, clean, merchantable wheat, valued at $1.25 per bushel,.... $75 36

Straw,.....	6 00
	$81 36
Deduct expense of cultivation,.....	39 31
Net profits,.....	$42 05

They award to J. Y. Kipp, of Pittstown, the first premium, for best crop of rye. The evidence furnished shows a yield of 193½ bushels of rye on six acres, two roods and twenty-four rods of land, valued at eighty cents per bushel, ...$154 80

970 bundles of straw,.....	9 70

Digitized by Google

Cost of cultivation, use of land, &c.,	80 13
Net profits,	$84 37

The committee also awarded to J. Y. Kipp, the premium on the best crop of barley, he having raised, as appears also from authenticated papers, on six acres, one rood and twenty-three rods of land,

257½ bushels of barley, valued at 94 cents,	$236 41
15½ loads of straw,	15 50
	$251 91
Deduct expense of cultivation, seed, and use of land,	84 05
Net profits,	$167 86

B. B. Kirtland, from the committee on corn, broom corn, flax, and timothy seed, reported:

That they award the first premium to Aaron J. Haynes, of Hoosick, he having raised 169½ bushels of corn on two acres of land, at a net profit of $42.40 per acre.

Daniel Baker, of Hoosick, second premium, he having produced 163½ bushels on two acres, at a profit of $41.70 per acre.

Francis S. McChesney, third premium, he having raised 108 bushels, on two acres, at a net profit of $25.18 per acre.

The committee award the first premium on flax to Benjamin Aiken, of Pittstown, he having raised, on one acre, 12 bushels of seed, valued at

$1.75 per bushel,	$21 00
471½ lbs. dressed flax, sold for 7½ cents before dressing,	35 32
	$56 32
Expense of cultivation, exclusive of use of land,	11 25
Net profits, land not included,	$45 07

Mr. Buswell, from the committee on root crops, reported: That there was but one application, and that was on potatoes, by Mr. Nahum Taft, of Pittstown, who raised 325 bushels of Long Johns on $\frac{99}{100}$ of an acre of land, which being less in amount of land than the rules required, the committee did not feel authorized in giving the premium.

The President, Hon. L. Chandler Ball, then delivered the annual address, which assumed more the character of a lecture on the mechanical formation of soils. The speaker illustrated his subject by experiments, which were

Digitized by Google

highly instructive and entertaining, and was listened to with great interest.

The officers of the Society elected for the ensuing year are as follows:

President, Benjamin B. Kirtland, Greenbush: Vice-Presidents, George Vail, John H. Willard, Geo. M. Selden, Le Grand B. Cannon, Troy; E. N. Pratt, Greenbush; Abram Golden, Schodack; Samuel W. Hoag, Nassau; I. S. Lewis, Petersburgh; Calvin Carpenter, Stephentown; R. J. Knowlson, Sandlake; Bedford Filkins, Lansingburgh; Horace Herrington, Brunswick; T. B. Wilds, Grafton; Joseph Haswell, Hoosick; Nathan Brownell, Pittstown; Isaac T. Grant, Schaghticoke; Jacob Minnick, Poestenkill; Winter Green, Berlin: Secretary, John J. Vielle: Treasurer, Abraham Van Tuyl: Executive Committee, Henry Warren, John B. Ford, W. F. Sage, Wm. S. Sands, Robert H. Hyde.

The committee in closing this report, congratulate themselves and the agricultural interest of the county generally, upon its progression and improved state. They hesitate not to express the opinion, that the organization of State and County agricultural societies, under the fostering care and patronage of the State, has realized the fondest expectations of its earliest friends. They hope for its continuance, and trust that under the impulse created and stimulus afforded by it, that the agricultural community will soon take that relative position in the scale of human avocations, to which, by its importance, it was always entitled.

JOHN JAY VIELLE, *Secretary.*

RICHMOND.

This Society was organized auxiliary to the State Society, December 17th, 1849.

Richmond county is situated in the harbor of New-York, being entirely comprised within the shores of Staten Island. From its vicinity to that city a considerable part of it is of a suburban character, and its purely agricultural surface is much smaller, than that subject to the report of any other society in the State. Nor is its agricultural importance comparatively to its size, so great as might be supposed from its apparent readiness of access to the best point of immediate consumption in the country. Distinguished for a varied surface of peculiar beauty, and a climate in which the extremes of both cold and heat incident to its latitude are much modified by its insular circumstance, it has been more grateful to the nature, and inciting to the taste of the wearied citizen, escaping from the vexations of business, than tempting to the avaricious skill of the husbandman. It is naturally

Digitized by Google

the pleasure ground by the gate of commerce, while districts of more simple landscape and warmer soil have been made the kitchen garden. The constant and generally healthy and sustained rise in the value of its land, with the increase of population and wealth of New-York, has thus withheld attention from its capabilities of agricultural improvement, while the whirl of trade, with the profits of fisheries, and other marine employment fostered by it, has absorbed and withdrawn from nobler occupation most of the youthful enterprise and capital of the county.

The crop which would make the largest money return, with the least demand for capital, enterprise, or hazard, has been hay; and with many farmers, every quality of soil and position, every circumstance of time and place has been disregarded or made subservient to the attainment of the largest area of mowing ground, the produce of which will pay for making and marketing. No more cattle are kept under this system than the farm requires for its own use, the deficiency of manure being supplied from the city; and as hay is measured against money, the stock is seldom much the better for it.

When the grass is absolutely no longer worth mowing, it is broken up and rotated back to its old estate as rapidly as possible. The usual course has been, first to plant Indian corn, manuring with yard dung "*in the hill.*" The next year a crop of oats follows, after which the land is bountifully manured, and grass and clover sown with wheat. If sown with spring grains, or rye, grass does not *come in* well with us. This course then sometimes varied by potatoes, turnips, or cabbages, in place of corn, and of barley instead of oats, is now generally approved and followed upon the island.

City manure, principally street sweepings, is used largely, being generally applied for wheat *and grass*, at an expense of from $20 to $30 an acre. We have known $40 worth to be frequently used. The crop of wheat is not often of sufficient value to return this cost of manure, (which is from twenty to thirty cubic yards of street dirt,) but if the soil is favorable and has been well cleaned of weeds, the grass will give a profit over the expense of haymaking and marketing from five to ten years. After the fifth year, or even before that, if there should be a severely dry season, the grass gradually *runs out*, or is superceded by daisy, wild carrot, St, John's wort, and other weeds. Even where there is a large proportion of these, there is usually a demand for the hay at slightly diminished valuation, for shipping to southern ports.

From a small part of the county having the poor sandy soil of New Jersey, which is opposite, melons and early vegetables are raised in considera-

Digitized by Google

ble quantity. The peach culture is also becoming of consequence here. A large part of the island is peculiarly well suited to the smaller fruits, and there is no reason in nature why they should not form an important object of its rural industry, though at present almost wholly neglected. Measures are about to be taken which it is hoped will encourage more attention to horticulture.

Within a few years hay has become much reduced in market value, and the wisdom of the old fashioned course is often doubted. Although the character of most of our soil is not favorable to that early and rapid vegetation from which the greatest profits of market gardening are secured, there is no doubt that its productive capacity is much greater than that of the soils which are mostly engaged in the *truck* business. It has been recently ascertained that by under draining a clayey loam, its season of vegetation is advanced as much as two weeks, while its fertile matter is rendered much more available to plants, and its production may be prodigiously increased. It yet remains for experience to satisfy our farmers that the profits of high culture and the summer market, are enough greater than those of the old system, to induce them to go to the large expense of so reconstructing their soils, (for such indeed is the operation of thorough draining,) that they may be able to compete with the Long Island and New Jersey market gardeners, and engage in it to advantage.

Some soils on the island seem to be peculiarly suited to the growth of late fall or winter cabbage, and it is often very profitable. It is not very generally tried, however, partly because of the large expenditures of labor and manure which is necessary to insure a good crop. The value of $50 an acre of manure, and much labor in harvest time, is usually given it. Of 10,000 plants set out, only from 3,000 to 6,000 can be expected to be marketable. Experiments made this year indicate that by thorough drainage, and the use of raw night-soil, the usual profits may be doubled. One of these experiments will be hereafter stated.

Last year, (October 5th, 1849,) a few neighbors formed a Farmers' Club. Its proceedings were attended with great interest, and its numbers very rapidly increased. Meetings for *conversation* on agricultural subjects were held weekly during the winter, at the residences of the members in rotation. The usefulness of this association, the construction and proceeding of which is very simple, in cultivating agricultural and social improvement, has been very great. Its privileges are highly valued by the members, and its meetings have been renewed this year with unabated attendance and interest.

Consequent upon proceedings of this Club, the County Agricultural Society was formed, as reported, December 17th, 1849. The first Presi-

Digitized by Google

dent of the Society is Nathan Barrett, Esq. The annual meeting is to be held in February. The number of members is about fifty.

The First Cattle Show and Fair of the Society was held in the village of Richmond, Oct. 30th. The exhibition, though of an humble character compared with those of many older societies and larger counties, was larger than had been anticipated, and every way creditable to the county. There was a considerable crowd of farmers in attendance, and the interest and emulation manifested was greatly gratifying and encouraging to the Society.

The show of horses and cattle was unexpectedly large and fine, and indicated an increased attention in the county to these important objects, which it is believed has been much stimulated by the Society.

The display of fruit was meagre, that of vegetables very excellent. The grain, corn, and seeds exhibited were generally of superior quality. The premiums on crops have not all been declared at the time of rendering this report, but the following returns, being well attested, are given to be recorded among the largest of the year in the county:

Indian Corn,	per acre,	80	bushels.	
Oats,	do	51	do	
Potatoes,	do	264	do	
Wheat,	do	30	do	Mediterranean.
Ruta Baga,	do	700	do	
Cabbages,	do	5000	heads, worth on the ground $125.	

These are all the results of economical field culture, and except potatoes, *averages* from crops of more than one acre.

Guano.—The crop of wheat was the result of a trial of Peruvian guano, four hundred weight to the acre; and was obtained in this way, at one-third the usual expenditure for street dirt, applied to the crop in *laying down* to grass. The weight was sixty-one pounds, the measured bushel. The other crops were simply the result of good farming in the ordinary way.

Sugar Beet.—Mr. John Thompson has raised this year upon a piece of ground measuring thirty eight by fifty-seven feet, four thousand two hundred and twenty-six pounds of sugar beet. The soil was deeply trenched and the plants two feet by eighteen inches apart. The yield is at the rate of forty-four tons, or about fifteen hundred bushels an acre.

Potatoes.—The same gentleman made an experiment to ascertain the best depth at which to plant potatoes. The seed was planted in trenched ground at depths of three, six, nine and twelve inches. Those produced at twelve inches were few and small; those at nine and three inches were of equal quality, and those at six inches much the most numerous and

Digitized by Google

largest. The deeper the potatoes were planted, the more *mealy* and finer quality was the produce.

DRAINING.—Two experiments in thorough draining made this year by officers of the Society, have been very successful. The subject of one was a field of potatoes, in which the quantity and quality of the crop was greatly better in the drained than in the undrained portions.

In the other case there was laid at depths of from two to six feet, about one mile of horse-shoe tile procured in New Jersey, at a cost of $16 a thousand feet. Part of the land drained was low and moist, and part ordinarily dry upland. The effect of draining was most satisfactory upon the highest land and over the deepest drains. The field including an equal portion of undrained land, which was estimated of better quality, but which in every other respect was equally well treated, was planted with cabbages early in July. The result, unfortunately, cannot be stated with absolute accuracy, but as establishing the economy of the improvement, it is sufficient to say, that the underdrained parts of the field, yield every where, much the best, largest and greatest number of marketable heads. The experimenter, a judicious and experinced practical farmer, estimates the value of the *additional* yield upon the drained land at *seventy dollars* an acre; a sum more than sufficient to refund the whole outlay upon this grand permanent improvement of his farm.

A DRAIN PIPE AND TILE MACHINE has been purchased in England by some officers of the Society, and will be put in operation in the county the ensuing spring. It is of larger capacity than any machine that has been hitherto imported, and of the pattern (Whitehead's patent) that received the highest commendation at the last meeting of the Royal Agricultural Society. It was selected with the assistance of Mr. Parks, the celebrated draining engineer.

There have been three plowing matches in the county this year, one under the direction of the County Society, the other two by arrangement of the Farmer's Club. In one of these, seven members of the club, driving their own teams and holding their own plows, competed, and the plowing was of a very superior order. The effect of these trials is believed to have been very useful.

An agricultural room has been furnished in the county court house for the purposes of the society, and an agricultural library reading room, and museum will be connected with it.

All of which is respectfully submitted.

F. L. OLMSTED, *Cor. Secretary.*

Southside, Dec. 4th, 1850.

Digitized by Google

ROCKLAND.

The Exhibition of the Rockland County Agricultural Society was the largest and best ever held in the county, and it is with pleasure I am enabled to say, our prospects of usefulness are more encouraging than at any time since the organization of the Society. The farmers and friends of the Society take a deep interest in its success, and are satisfied it is exerting an influence which cannot but effect a general improvement in our system of farming, and consequently add much to the wealth of the county. The Fair was held on the 4th and 5th of October. The first day was devoted to the exhibition, and the annual address. The second day, the plowing match, awarding of premiums, and election of officers. A large number of persons were on the ground, well pleased with the productions of the farm and garden, the enterprize and ingenuity of our mechanics, and the skill and fancy work of our farmers' wives and daughters.

The exhibition of stock was quite large, and of a better quality than usual, and gives evidence that the farmers of this county are waking up to the importance of improving their stock of cattle. The show of vegetables was good, and fruit excellent, with the exception of Isabella grapes, which have been a failure in this county, not having ripened in time to escape the frost.

The address was delivered by H. G. Prall, Esq., Haverstraw. It was well adapted to the occasion, and was listened to with deep interest by all present. A copy was requested for publication, and was circulated through the county.

The exercises of the second day commenced with the plowing match. The piece of ground selected was a stiff sward, with a good sprinkling of "cobble stones." The plowing occupied nearly the whole time allowed, which was seventy-five minutes; the work was well done, and the first premium awarded to Erastus Johnson, Esq., Secretary of the Society.

After dinner the meeting was called together under the large tent, (which had been borrowed for the use of the members,) to hear the reports of the committees, and for the election of officers. The comfort and convenience of a tent were so manifest, that a subscription was started to purchase one for the Society, and $40 raised on the spot.

Abstract of the proceedings of the Society.

Balance in hand last year,	$51 24
Received from members,	52 50
Appropriation from the State,	36 00
	$139 74

Digitized by Google

Cash paid in premiums,	$88 87
Bill for lumber, &c.,	2 53
Bill for printing,	4 00
Miscellaneous,	2 38
	$97 78
Balance in hand,	41 96
	$139 74

J. M. DEDERER, *President.*

The following persons were elected officers for the year 1851:—President—Abram B. Conger, Haverstraw. Vice-Presidents—John C. Blauvelt, Orangetown; John Van Houten, Clarkstown; John R. Coe, Ramapo; John W. Felter, Haverstraw. Treasurer—John E. Hogenkamp, Clarkstown. Corresponding Secretary—Isaac Sloat, Blauveltville. Recording Secretary—Erastus Johnson, Spring Valley. Executive Committee—Matthew D. Bogert, Archibald Cassidy, A. Thompson Blauvelt, Ashbury D. Noyelles.

SARATOGA.

The Tenth Annual Fair and Cattle Show of the Saratoga County Agricultural Society, was held at Mechanicsville, on Tuesday and Wednesday, the 17th and 18th of September, and was one of the most interesting exhibitions of the kind ever held in this county: The weather was fine, the exhibition of stock and articles unusually great, and the collection of people much larger than on any former occasion. *Since the holding of the State Fair* at Saratoga Springs, a better feeling in regard to exhibitions of this kind has pervaded the people, and those who before seemed to know or care but little about them, are stirred up to more engagedness and activity. As a general thing, farmers are not willing to take these things on trust. They must see, in order to believe. We hazard nothing in saying, there is at the present time in this county, an onward and upward movement in the cause of agriculture, and that the time is not far distant when we shall take our stand among the first counties in the State for agricultural and manufacturing productions. Since the introduction of railroads to us, manufactories of various kinds have sprung up, and are rapidly increasing. This, together with our world-renowned mineral waters, furnish a home market seldom found at a point so remote from the sea-board.

The vegetable and floral departments of our Fair were thought to exceed those of the late State Fair, whilst those of the dairy were quite equal to it.

Digitized by Google

Among the many objects of interest exhibited, was a case and collection of revolutionary relics, owned by Samuel G. Eddy, of Stillwater, who is entitled to much praise for the assiduity he has manifested in collecting and preserving them. The most of them were from the battle ground of Bemis Heights, consisting in part, of the sword of General Schuyler, piece of plank on which General Frazier died, Hessian sword, British pontoon, musket barrels, locks, bayonets, cannon and musket balls, axes, hatches, tomahawks, handcuffs, &c., &c.

The plan adopted by us one year since, of enclosing the grounds and an admission fee of one shilling each at the gate, works admirably. Before, it was a begging uphill business, seldom realizing enough to the Society to entitle us to draw the State appropriation, now there is no lack. Our premiums are increased and enlarged, more interest than under the old management is manifested, and every thing betokens, "a good time is coming." We most cordially recommend to those counties which have not adopted enclosed grounds to omit it no longer.

Professor Mapes, of N. J., was advertised to deliver the annual address on the afternoon of the second day, but not being present, Ambrose Wager, Esq., of Rhinebeck, was invited to supply his place, and though with but little time to prepare himself, gave us an able, interesting, and instructive address of one hour's duration, eloquently pointing out the importance of connecting science with the art of agriculture. At its close, an unanimous vote of thanks was tendered Mr. W. and a copy requested for publication, in pamphlet form, at the expense of the Society.

Officers for 1851.—Lewis E. Smith, of Halfmoon, President; Samuel R. Garret, of Ballston, 1st Vice President; Stephen Burtis, of Stillwater, 2d Vice President; Cramer Vernum, of Mechanicsville, Corresponding Secretary; John A. Corey, of Saratoga Springs, Recording Secretary; Edward W. Lee, of Ballston Spa, Treasurer; and an Executive Committee of two from each town in the county.

Much credit is due John A. Corey, Esq., our Recording Secretary, for the able and efficient manner in which he has conducted the affairs of our Society, from its commencement to the present time. Mr. C. is about publishing an agricultural paper under the title of the Saratoga Farmer. May success attend him.

A committee of five were appointed to memorialize our next Legislature in favor of establishing an Agricultural College and experimental farm in this State.

It is proposed to adopt hereafter the Wayne county plan of holding the Fair in two different parts of the county, at periods some two weeks apart.

Digitized by Google

This it is believed will greatly conduce to the convenience of the members and increase the funds of the Society.

SETH WHALEN, *President*.

Farm Crops.

At a meeting of the board on the 11th December, there was awarded to Isaac H. Thorn, of Waterford, a premium for the best crop of Indian corn, seventy-eight bushels and nineteen quarts per acre; the variety, Dutton corn. Mr. Thorn was the only applicant for premium on farm crops. The statement of Mr. Thorn which is very full and satisfactory, shows that the expense of raising the corn was seven dollars per acre. The land was a red clover sod of one years standing, and was pastured the previous year. About fifteen loads of barn-yard manure was used per acre. The corn planted 24th of May, in hills three feet three inches each way, topped the fore part of September, and harvested in October. Plowed twice each way, between the rows at the time of hoeing, and then plastered, and plowed twice afterwards and then hilled.

SENECA.

The farmers of the county of Seneca having witnessed for several years the benefits and advantages derived from the County Agricultural Society, have dismissed the doubt which in the early days of its organization retarded its growth, and impeded its action. A generous support is now afforded from every town in the county; the annual celebrations and cattle shows are deemed festivals and holidays, when families from the distant borders of the county and every intermediate point may assemble, forming new friendships, renewing and cementing those of former days.

As years roll on, facts are disclosed among the members tending to ensure an increase of products, with less risk of failure of crops; systems for breeding, feeding, and rearing of stock are examined, waste is prevented, economy promoted. Encouraged by the zeal of its members, the Society now ventures to look beyond the limits of the county. The information derived from the statistics collected in the year 1848, pointed directly to the branches of agriculture which were neglected, as well as to such as received the most careful attention of the people. The members could not fail to see that broad ground existed for the better cultivation of wheat not only, which is the principal crop; but likewise for the increase of other crops, and of stock. The facts distinctly brought to view by the returns from the several towns, proved, among other things, the necessity for stimulating the production of agricultural products in such proportions as that an excess of

Digitized by Google

each should exist at the close of every harvest, over and above the wants of the inhabitants. It is believed to be indicative of bad farming and careless views of public policy, when a county imports any article of agricultural product. Acting on this belief, the Society has extended and increased its premiums, not doubting but it will receive the zealous support and co-operation of every farmer who loves his town, his county, or the general welfare.

The late celebration of the Annual Fair has fully realised the expectations of the executive committee, giving sanction to the views above expressed, and encouragement for renewed exertions. Aware of the importance attached by the State Society to a survey of the several counties of this State, and that measures had been taken to develope the resources and capabilities of the county of Seneca, before the expiration of the year, and having ascertained that the work will exhibit the advantages and deficiencies of the county, its history, the elements of its soil, its products, systems, and general economy, and knowing that every square mile in the county has been visited and examined, with a view to accurate statements, it is deemed less important to present a detailed annual report of the condition of the county, than under other circumstances would have been the duty of the Society to present.

The Annual Fair and Cattle Show for 1850, was held on the 26th and 27th of September, at Ovid. The various classes of stock offered for premium far outnumbered any previous exhibition. Grain maintained its usual excellence, but will be more particularly noticed at the winter meeting. Many samples of flour were exhibited under the regulations of the Society, to test the value of the various kinds of wheat.

The mechanic arts are carefully encouraged by the Society, well knowing that the science of mechanics, the proper application of power, and the due direction of motion, are indispensable to the well doing of the farmer. Domestic fabrics never cease to interest a large portion of the community, and the rooms were well supplied from the ingenuity and industry of our wives and daughters.

The plowmen of the county, ever ready to show their skill in using this first best implement of agriculture, were strong in numbers, and excelled in their work, probably second to none in all the breadth of the State.

The proprietors of farms evince an emulation honorable and gratifying; the rivalry is generous and noble; each desires to excel, yet with so good a spirit and motive, that he who obtains the lesser reward, or remains among the many who do not reach it, rejoices in the success of his brother competitors, resolving by study and industry to reach the highest premium ere

Digitized by Google

he retires from the contest. An admirable illustration of this noble feeling has been manifested among the competitors for the farm premiums during the several past years.

The Society and its friends began to assemble at the court house on the second day of the Fair, to hear an address from Professor John P. Norton, of Yale College. Long before the appointed hour the court room was crowded to excess; every avenue was filled with anxious faces endeavoring to obtain entrance. Upon consultation it was deemed advisable to adjourn to the public square. Arrangements were made by the erection of a temporary stage in front of the public buildings, while the choir and a large number of ladies occupied the portico and vestibule. Thus accommodated, Professor Norton held the throng in close attention for an hour and a half, explaining the elements of the wheat plant, of the soil, and their relation to each other.

After a hearty call upon Prof. Norton for a copy of his address, and a warm expression of thanks, the reports of the several examining committees were read, and the premiums awarded.

The committee on farms award the premium to Mr. Groves, for the "neatest farm in the State;" adding, "we do so believe it, and challenge the State to beat it." This is a new feature, deserving high commendation and encouragement.

The financial condition of the Society is satisfactory; the fund in the treasurer's hands, at the date of the Annual Fair was $417.62—from which the various premiums awarded, and the current expenses were paid, leaving in the treasury, on the 10th December, 1850, the sum of $29.93.

The winter meeting of the Society was held, pursuant to notice, at the Union Hotel, in Romulus, the President in the chair. Treasurer's report read and accepted, as follows:

Balance on hand, as per last report,	$84 62
Received from State,	74 00
Received from members,	294 00
	$452 62

Paid premiums,	$270 50
Printing,	32 75
Books and Stationery,	7 44
Prof. Norton's Address,	25 00
Tent, Court House, Pens, &c.,	37 00

Digitized by Google

Postage to J. Delafield, as per resolution, ...	10 00
Balance in Treasurer's hands, Feb. 6, 1851, ...	19 93
	$452 62

The President called attention to specimens of soils which had been analyzed during the past summer. These specimens are useful as a guide for those who wish to purchase farms, and also for future reference and comparison.

The specimens are to be deposited with the county clerk, to be arranged by him for exhibition in his office.

Officers, 1851.—President—John L. Eastman, Lodi; Vice-Presidents, Orrin Southwick, Junius; R. L. Stevenson, Tyre; C. D. Mynderse, Seneca Falls; Geo. C. P, Teall, Waterloo; Alexander Rorison, Fayette; Joseph Wyckoff, Varick; Peter J. Van Vleet, Romulus; D. D. Scott, Ovid; W. F. Coan, Lodi; Milo V. Cole, Covert; Treasurer, John D. Coe, Romulus; Secretary, Henry D. Didama.

Mr. W. F. Coan offered the following resolutions, which were carried unanimously, and ordered to be entered on the minutes.

Resolved, That the thanks of the farmers of this county are due Mr. Delafield, for his exertions and untiring perseverance to place the Lake county in the proud position she now occupies.

Resolved, That in selecting John Delafield to preside over its deliberations, the State Agricultural Society has consulted its best interests, and honored us.

Mr. Delafield made a brief and happy reply, and was enthusiastically cheered.

Proposals for holding the next Fair were then received.

Fifteen persons in Bearytown offered	$250 50
One hundred and forty in Ovid offered	280 00
Eighty in Waterloo offered	287 00

The Society voted to hold the next Fair at Waterloo, on Thursday and Friday, the 9th and 10th of October, 1851.

The committee on flour, grain, &c., (Messrs. Folwell, Dunlap and Sutton,) awarded the premium for the best barrel of Flour to N. H. Wyckoff & Co., of Lodi Stone Mills. Mr. Wyckoff used the White Flint wheat in his experiment, weighing fifty-nine pounds per bushel, and yielding a barrel of flour from four bushels of the wheat.

Best five acres of wheat, 31 42-60 bushels per acre, A. Rorison.

Best clover seed 4¼ bushels per acre, P. J. Van Vleet.

H. D. DIDAMA, *Secretary.*

Digitized by Google

The committee on discretionary premiums, on presenting the annexed results of the experiments of Wyckoff & Co., of Lodi Mills, on five different varieties of wheat, award to them a premium of $3.

To the President of the Seneca County Agricultural Society:

The following is the result of the yield of five different varieties of wheat; sixty pounds of each, and weighing per bushel as follows: Flint, 59 lbs.; Seneca White, 58; Bald, 60; Stokum 62; Hutchinson 61.

	Hutchinson.		Seneca White.		Stokum.		Bald.		Flint.	
	lb	oz	lb	oz	lb	oz	lb	oz	lb	oz
Flour, Sup., ...	46	03	47	08	47	10	46	00	47	08
Flour, fine,.....	1	04	1	10	1	08	2	00	1	07
Cornell, ...	2	01	2	06	2	07	3	11	3	02
Bran and shorts,.	8	11	7	05	7	08	6	11	7	04
Waste, ...	1	08	1	03		15	1	10		11

WYCKOFF & CO.

Lodi Stone Mills, Sept., 1850.

It appears from these experiments that the Seneca white wheat, so named, but which strongly resembles the Soles wheat, and the Stokum wheat, yields the largest amount of flour from sixty pounds of wheat. The quality of flour from the Seneca white was superior to that of the Stokum wheat, presenting a purer appearance, and more free from specks. Although the Stokum wheat exceeds in weight any other variety exhibited, in consequence of the darkness of the berry, which detracts from its value in the market, it will probably not be very generally cultivated. The best and most marketable flour is invariably manufactured from the different varieties of white wheat. The berry of the Seneca white, or, perhaps, more properly, the Soles wheat, is a beautiful white, that exhibited not quite as plump and uniform in appearance as the Hutchinson or Flint, which accounts for its deficiency in weight, fifty-six pounds per bushel. We think the Society is indebted to Wyckoff & Co., for these interesting experiments; and in order to arrive at more satisfactory results, they would suggest a repetition of them the coming year. It is a generally admitted fact by all intelligent and experienced millers, corroborated by the most carefully conducted experiments by scientific men, that the quantity and quality of flour made from the different kinds of wheat, depend upon the time of harvesting the same. That wheat left standing until it becomes dead ripe, yields a less amount and an inferior quality of flour than that cut at an earlier day. That which would have been flour, as the grain matures, is converted into bran and consequently detracts much from its intrinsic value for milling

Digitized by Google

purposes. Hence the importance, in order to arrive at a satisfactory result, of harvesting the different varieties to be tested, at the same stage of ripening.

SUFFOLK.

The Suffolk County Agricultural Society held its seventh Annual Exhibition in the village of Babylon, on the 24th day of September. The weather was fortunately propitious, and consequently a very numerous assemblage was present, from all sections of the county. Extensive arrangements were made for the convenience of exhibitors in the erection of a temporary building one hundred feet in length, which was well stocked with the produce of the farm and garden, to an extent unprecedented, and surpassing all former exhibitions. A new feature in the exhibition, was the display of agricultural products raised on the *pine plain land* adjoining the Long Island Railroad, for which distinct premiums were advertised previous to the Fair. Much has been said and written in reference to those tracts of land. They have been recently sold, and are now undergoing systematic improvement. The Society deemed all crops raised on newly improved lands, within one mile of the railroad, as worthy of separate notice, and therefore offered distinct premiums.

The past season commenced favorably, but, owing to a very severe gale from the south east, July 17th, the corn and oat crops were much injured by being blown down. Hay was more than an average crop. Wheat was very fair, having been free from the rust, which proved so injurious in 1849. Potatoes were good, but in some places slightly affected with the rot. Buckwheat proved unusually fine, the latter part of the season being very favorable for maturing it.

The annual address at our Fair was delivered by John Fowler, Jr., Esq., of New-York, and proved satisfactory, from its literary character and practical knowledge, to a large and attentive audience.

The premiums at the winter meeting have not yet been awarded.

One of the best crops of wheat offered for premium was that of Samuel L. Thompson, of Setauket, who raised eighty-four bushels, twenty quarts, and one pint of "Verplanck wheat" (Australian,) on two acres, netting him $5 per bushel, as sold for seed.

Officers, 1851.—Edward Henry Smith, of Smithtown, President; William Nicoll, of Islip, Vice-President; William Lawrence, of Smithtown, Treasurer; Nathaniel Smith, of Smithtown, Secretary; Directors, Harvey W. Vail, of Islip; John Lawrence, of Smithtown; Elbert Walters, of Huntington.

A. G. THOMPSON, Jr.

Digitized by Google

SULLIVAN.

The Third Fair of the Sullivan County Agricultural Society was held at Monticello, on the 2nd and 3rd days of October. The weather was very stormy, and the county court unexpectedly held over through the time of the Fair. The President and some of the members were engaged in court. We could not occupy the court house as usual. Notwithstanding these discouragements, the show of stock was very fine, surpassing former years. There was a fine display of fruits, which excited general admiration; the finest collection ever seen in this county. Notwithstanding the storm, the ladies were out, and made a fine show of their handiwork, as usual.

The Fair for awarding the premiums on grain crops was held on the 11th day of December. Some fine samples of grain were exhibited, and premiums awarded—the statements of some of which are herewith sent. In consequence of the lateness in the season of the Fair, a part of the premiums only have as yet been paid.

Farm Crops.

Indian Corn—J. Lounsbury, 83½ bushels per acre.

Oats—S. Wheeler, 59¾ bushels per acre.

Officers, 1851.—Lotan Smith, President, (Liberty P. O.,) Fallsburgh; James H. Foster, Recording Secretary; M. L. Bushnell, Treasurer; Vice-Presidents, C. S. Woodward, John Drake, Jesse M. Foster, Lewis Moore, R. Rumsey, James Ellis, G. W. Northrop, N. Flagler, Alfred Norris, Henry Mead, John P. Jones.

TIOGA.

In this county, there is not at present an Agricultural Society, but it is hoped that efforts will be made to organize an efficient Society, and through its influence improve and advance the interests of agriculture.

The following remarks, on the subject of farming, are from the Hon. Gamaliel H. Barstow, whose experience and intelligence has led him to adopt a system himself, at once economical and profitable, and whose suggestions are deserving of the attention of all. He says:

The winter has been very mild, with little snow, and a great deal of rain. The ground, of course, bare most of the time, and nearly half of the time it has been warm and muddy. Uniform cold weather, in the winter, is undoubtedly best for wintering cattle. They will eat less in a warm season than in a cold one, but they will waste more, unless stabled. Few of our common, small farmers, stable their cattle; and, indeed, I know of none

Digitized by Google

with us who stable their whole stock. Whether cattle are stabled or not, hay should never be thrown on the ground when you fodder. It is but little trouble or expense to make mangers on the outer edge of your barn-yard, in which to throw the fodder; it cannot then be trodden under foot.

These mangers may be made by driving down a few posts, from four to six inches in diameter, about eighteen inches from the fence, and nail boards about two feet high on these posts, and fasten the whole with an occasional cross-tie to the fence, so as to prevent their being thrown down. In this way no fodder is wasted, whatever may be the condition of the barn-yard. The motto of the farmer should be, "waste nothing," and it would not be a bad motto for every body else.

The old way of making what are called *racks* in barn-yards will not answer. These have been made in their rudest form, by crossing stakes over a pole raised two feet from the ground, and throwing your straw or hay into the crib, made above the pole. These have generally been placed in the center of the yard, so that cattle can go round them. This method is generally, though not universally, abandoned, as it is found the cattle pull out the fodder from between the stakes, and tread it under foot.

I approve of stabling cattle. It is a matter of economy, but inasmuch as our farmers in general will let their cattle lie out of door, they ought to have convenient sheds at least for them to lie under, and fodder them in the way above recommended. If men will not do the best thing for themselves, it is well to try to induce them to do the next best. I have long been satisfied that indolent habits, more than a real want of knowledge, have most influence in keeping so many farms in a slovenly condition. Mankind love their ease, and labor generally is resorted to as a matter of necessity. Although all sensible men agree, that it is well for the world, that labor is made necessary, as it keeps men quiet, and sober, and out of bad habits; yet all desire, sooner or later, to be able to live without it. For myself I am obliged to say, that habits of industry were so strongly impressed upon me in early life, that I should hardly be able to content myself with a life of idleness, even in my old age.

Mr. Robert Howell's account of crops on pine and hemlock land:

In 1838, we cleared about four acres that were heavily timbered, the timber principally pine and hemlock. In consequence of the fall being cold and stormy, we did not sow it with winter wheat. In the following spring we sowed it with spring wheat, and seeded it down; the wheat was rather light, yielding about twelve bushels per acre. This field in a few years became mossy and briary in patches. In 1848, in June, we mowed the briars, and pulled the small stumps with a yoke of oxen, and plowed the

Digitized by Google

ground the first time about the first of July; we cross-plowed the same and dragged for buckwheat, but in consequence of two heavy rains, we did not sow till the fourteenth of the month. About the middle of September we cut the buckwheat from about four acres, which was very heavy. There were on an average on the field, sixty-five large stumps to the acre, besides a number of loads of stone. After taking off the buckwheat, about the last of October, we turned the stubble under and sowed rye on one acre, and wheat on the residue. The wheat and rye came up that fall; in the spring the grain was very poor to appearance. It was sown with plaster about the last of April, and harvested in July. In the fall, a few bushels of the rye was thrashed for seed, and the residue in February, and carefully measured, and the yield was thirty-four bushels of very heavy rye. Upon the ground where the rye grew, there was from seventy-two to seventy-six large stumps. The wheat was a little lighter than usual. The above statement is given to show that there will grow good crops on this pine and hemlock land, where this moss, (called by some botanists, the club moss,) grows, contrary to the opinion of some writers. This moss grows generally about two inches high, with a very slim red stalk, and a large whitish head elongated.

ULSTER.

In consequence of the rain on the 26th and 27th of September, the Annual Fair of the Ulster County Agricultural Society was postponed until the 8th and 9th of October. It was held in the village of Kingston, and although the exhibition was not so large as it probably would have been, had it not been postponed, yet the large number of individuals present fully demonstrate the additional interest which is taken in the exhibitions of the Society. The display of horses, and particularly of single horses, was excellent. The display of cattle was decidedly the best ever exhibited in Ulster. The number of specimens of domestic articles was not large, but those exhibited were of a superior quality.

The plowing match, held on the second day of the Fair, produced considerable excitement. Several teams were entered, and the plowing was unquestionably the best I ever saw. An animated and interesting address was delivered on the grounds by the Hon. J. S. Gould, of Columbia county.

The following premiums were awarded on field crops:

On Wheat.

1st premium to Dr. Peter Crispell, Jr., 30 bushels to the acre.
2d do Solomon D. Crispell, $22\frac{4}{33}$ do do

Digitized by Google

On Oats.

1st premium to Dr. Peter Crispell, Jr., $67\frac{6}{32}$ bushels to the acre.
2d do Solomon D. Crispell, $61\frac{8}{32}$ do do

On Corn.

1st premium to Dr. Peter Crispell, Jr., $114\frac{10}{32}$ do do
2d do Abraham Rosa, ... $103\frac{7}{32}$ do do

To James Cantine was awarded a premium for Ruta Bagas, 70 bushels on one-fifth of an acre.

The wheat in both cases was raised on clover sod, manured on sod in June, and plowed once only. The oats were raised on corn stubble, and the corn on old sod, manured highly.

The officers for the ensuing year are as follows:

President, Peter H. Brink, Saugerties: Vice-Presidents, Joseph Arnold, Esopus; C. M. Van Luven, Kingston; Philip Hornbeck, Rochester; D. L. Bernard, Plattekill: Recording Secretary, Peter Crispell, Jr., Hurley: Corresponding Secretary, Wm. Cockburn, Kingston: Treasurer, R. A. Chipp, Kingston.

P. H. BRINK, *President.*

WASHINGTON.

The Tenth Annual Cattle Show and Fair was held at Argyle, September 18th and 19th. The concourse of citizens in attendance was unexpectedly large, affording gratifying evidence of unabated interest in the Society's exhibitions.

The first day of the Fair was devoted to the show and examination of stock, implements, carriages and machinery, that covered the lawn surrounding our spacious tent, the tent itself being occupied with cloths and carpets, household manufactures, both useful and ornamental, and the various products of the dairy, the orchard and the garden, tastefully arranged.

In the forenoon of the second day, we had a spirited plowing match. The afternoon was occupied with the annual address by Le Roy Mowry, Esq., the reading of the reports of the different committees, and the paying of premiums. Of stock entered the following is an abstract: horses, eighty-six; cattle, one hundred and eleven; sheep, sixty-one; swine, twenty-three.

The different departments of dairy products, domestic manufactures, ladies' department, and farm implements, all had their attractions, without any thing entitling either to especial notice. In the mechanical department, the show of farm and pleasure carriages, was unusually large and excellent.

Such an occasion furnishes to the mechanic and artisan a capital opportu-

Digitized by Google

nity to advertise and display the varied products of their skill, and results in profit as well as pleasure to both buyer and seller.

The Society's second meeting was held at the same place on the 10th of December, to award premiums on crops that were immature at the September meeting. In this department the show was lean, and in default of competition, not half the premiums offered were awarded.

Heretofore our annual show has been held in that town which offered the most money for the location. At our last meeting, a permanent location was proposed, its merits discussed, the necessity of such a measure generally conceded, and a committee appointed to collect facts bearing on this question from those who have already adopted the plan, and report to the Society, which adjourned to meet for the purpose of considering the subject on the second Tuesday of May next.

Officers for 1851.—President, Harvey Brown, South Hartford; Vice Presidents, Henry Holmes, Greenwich; James Savage, Argyle; J. E. Newcomb, Whitehall; John M. Stevenson, Cambridge; Edward Bulkley, West Granville; Treasurer, Ahira Eldridge, North Whitecreek; Corresponding Secretary, John McDonald, Salem; Recording Secretary, Le Roy Mowry, Greenwich, and an Executive Committee of two in each town.

The Treasurer has received for the current year, including balance on hand, reported 1849, ... $509 41
Paid out 290 80

Balance on hand, ... 218 61

JOHN McDONALD, *Cor. Secretary.*

SILK AND COCOONS.

The committee on silk and cocoons report, that both the soil and the climate of Washington county are favorably adapted to the cultivation of silk. The white mulbery is easily raised, is a hardy tree, enduring the rigor of our seasons, grows luxuriantly, requiring but little culture and yields good food for the silk worm. This tree has attained the age of something like-half a century in the county, showing it is naturalized to our climate and that its healthy and vigorous appearance is a proof that our soil is adapted to its growth. From this tree the silk growers of the eastern continent with the aid of the silk-worm make their wealth. The fact also that the valuable specimens of silk manufactured in the county, and for a course of years have

Digitized by Google

been presented for inspection and premiums at our Annual Fairs, is an evidence that this climate is favorable to the life, health, and labor of the silk-worm.

The demand for silk is universal, and to human appearances increasing; either as an article of dress, or, as essential in the structure of garments. It is estimated that $25,000,000 are annually expended in the United States for silk; which at a fair estimate will give the inhabitants of Washton county an annual tax of $45,000 for this single article of home consumption. This will not be doubted, if an estimation is made upon the value of silk and satin vests, cravats and velvets used by gentlemen; and the more expensive ornaments and dresses which rattle upon the dignified forms of the ladies.

If the demand is so great and our soil and climate so favorable to the growth of silk, it may be asked with emphasis, what hinders Washington county from becoming as far-famed and praise worthy for her domestic silks, as for her honored mechanics, her splendid farms, rich dairies, blooded horses, noble stock, superb fleeces, heavy pork, great crops and rich farmers?

The committee, in the discharge of their official appointment, have examined the specimens of raw silk, knitting and sewing silk and cocoons presented, and in their judgment find them of excellent quality.

WAYNE.

Our Treasurer, J. D. Ford, Esq., of Newark, has been unavoidably prevented by a train of circumstances too numerous to be herein detailed, from completing his report in proper time to present with this to the State Society.

With the annexed figures for the result of his report, which I transmit in haste, fearing our report will, even now, be quite too late.

Amount received from	former treasurer,.....	$42 00
do	State,.....	126 00
do	memberships,.....	346 00
		$514 00
Paid premiums and expenses,.....		336 90
Balance on hand,.....		$177 10

The above must be my apology for attempting to make a report, in the

Digitized by Google

absence of all statistics and reports of committees, entirely from recollection, which must at best be unavoidably too vague and indefinite.

The Wayne County Agricultural Society pursue, with decided advantage, the experiment of holding two Fairs, at locations convenient for the attendance of the people, who appreciate the extra trouble, so cheerfully taken upon themselves by her officers for their accommodation; and turn out, men, women, and children, and not only to be seen at her Fairs was the human portion of creation by thousands, but *all* the beauties and varieties of fruits, and the vegetable kingdom, produceed in this latitude, and unprecedented hereto the finest specimens of useful domestic animals. Poultry, from the highest "Hen fever" varieties, down to the old *speckled* hen—implements and articles of utility and beauty, sufficient to convince the host of astonished admirers that "Yankee invention," energy, and enterprise, have placed "shoulder to shoulder," determined to make Wayne county, as nature designed her to be, the *best* rural district in the Empire State; and that all should be perfection, the *authors* and finishers of our *domestic* departments, came in with countless evidences of their industry and skill, and had not rain storms came to our relief, it is not possible to tell where we could have found room to exhibit their fabrics, in a manner properly claimed by their beauty and excellence.

To attempt to particularize, can be readily imagined from the above facts, would be the merest folly. I will therefore only state that the first fair was held at Clyde, on the 18th and 19th September, and the second at Palmyra, on the 25th and 26th of September, and that both far surpassed the highest anticipations of all.

The citizens at each location erected suitable halls and fixtures upon the show grounds, furnished pasture and new hay for stock, without charge to the Society. The plowing matches were attended with an interest that gave evidence of an exceeding desire to improve in the nice art of turning and pulverizing the soil with the plow. The latest improved plows worked admirably.

A public sale was held upon the grounds, which added much to the interest of the fairs, and many animals and articles changed hands mutually advantageous to the parties concerned.

Our entries for premiums were about 500 at each fair, and all things pertaining to our fairs gave convincing evidence that progress to perfection is the only aim, and to make that the sure result, a commendable competition and strife are visible in each assembly district, originating in the circumstance of holding two fairs, one in each.

Prof. John P. Norton, of Yale College, gave the Society an address, at

Digitized by Google

each Fair, which, from their highly scientific and at the same time plain practical bearing, and the very attentive manner in which they were listened to, we may calculate they will have a lasting and beneficent influence in our county.

But two farms were entered for premiums, one of seven hundred acres, belonging to Col. S. S. Briggs, in the town of Galen, which was represented by report of owner and committee, as being in a high state of cultivation, and now undergoing important improvements, in reclaiming marshes, clearing the fields entirely of stone, and converting them into fences; buildings well arranged, principally of wood, and in good repair; water, convenient and plenty; and in every particular so arranged as to produce the best returns for capital and labor. The proceeds, after deducting for seed, labor, wear and tear, notwithstanding the expensive improvements, are reported over $3,500 annually. Judging from present indications, the persevering proprietor of this handsome domain will soon make it compare well with any farm in the State—to him the first premium, $8, was awarded. Another well cultivated and handsome farm, belonging to Henry Grayham, Esq., of Rose, received the second premium, $6. Much was said by the committee in commendation of the profitable management of these farms, which I must do the proprietors the injustice to omit, for want of a copy of the report, which I could not conveniently obtain in time.

The annual meeting was held on the 11th of December, 1851.

Officers, 1851.—President, Stephen Hyde, of Palmyra; Corresponding Secretary, R. G. Pardee, of Palmyra; Recording Secretary, Daniel Kenyon, of Newark; Treasurer, Jas. D. Ford, Newark. Also, seven Vice-Presidents and Executive Committee.

JOS. WATSON, *President*.

WYOMING.

The Seventh Annual Fair and Cattle Show of this County, was held at Warsaw, on the 25th and 26th days of September.

Although a hard rain commenced the first day of the fair, and continued most of the time until its close, the attendance was unusually large, and was variously estimated at from five to ten thousand persons.

The number of horses and cattle was not as large as we have seen at our previous fairs, but were generally of a rare and superior quality, the display of horses was in every way creditable to our county. Our exhibition of sheep and hogs was very large, and in many particulars better than our previous ones.

Digitized by Google

Nearly all the animals were in fine condition, of extraordinary good size, according to age, and a variety of breeds of each kind presented, gave satisfactory evidence of an additional attention bestowed upon this great interest in agricultural improvement. In these particulars we should not have suffered by a comparison with any sister counties in the State.

The productions of the county, such as butter, cheese, honey, sugar, &c., were well represented, and the quality of the cheese equal to any ever presented, and last year it was all so nearly alike that the committee divided the premium equally among six competitors. They pronounced each specimen a superior quality, and equal to the best they ever saw, not excepting at the late State Fair, and challenge the State to compete with Wyoming in cheese-making.

Domestic manufactures were presented in abundance, and contributed largely to the interest of our fair, fully establishing the good taste, ingenuity, and industry of our citizens, by actual demonstration. I am gratified to be able to say, that in various branches of important manufactures, and also in the production of the mechanic arts, improvements and delicacy of finish were strikingly visible, from any former year.

The mechanical productions of agricultural implements were not as numerous as at most previous fairs, owing undoubtedly to the inclement weather; such, however, as were presented on the ground were very much improved in make and availability. This department always evinces the unceasing strife of progress, which seems to be greater with mechanics, generally, than with farmers; the reason for which I attribute to the fact that mechanics, from their business, study more those natural laws without which no considerable eminence can be obtained in this age of improvement, in any of the departments of human affairs. Again, it is true that agriculture has been steeped in slothfulness, and mankind have planted and sowed as though the earth must bring forth spontaneously, without attention, or thought, that the thing to be produced must best succeed in a soil combining the most alembic proportions of itself. Perhaps it may not be amiss for me to express the prevailing idea of our most intelligent farmers, that schools and colleges, with suitable instructors, are imperiously needed in this department.

Agriculture requires a knowledge of the sciences, so they may be practically applied in all their principles to the various modes of working and treating soils—a fact that calls for the fostering care of our Legislature, heretofore so little bestowed, in proportion to the encouragement given by it to most of the professions.

The aid of science is shedding its light over the long neglected fields of

Digitized by Google

agriculture, and what has formerly been held as fine wrought, philosophical disquisition, has been well defined, and begins to be practically understood. The application of labor-saving machines to agricultural pursuits is of vast importance, and the day of steam-plows, steam-reapers, and steam-hay-rakers, may be nearer than we at present conceive. Science, in its discoveries, annihilates the old humbug, "that any machine that does away the amount of manual labor, generally performed by the poorer class of community, goes so far to their detriment in gaining employment," by opening with each application of an unused original principle, a thousand other avenues for industrial pursuits. There is, too, something attached to the popular idea, that agriculture is not among the accomplishments of a gentleman and scholar. This idea must be driven from the public mind, for the greatest interest of any country must be its agriculture.

At our late fair, we were to be instructed by the reports of the various committees, in accordance with a former resolution, that we might prove by experience which source was the most profitable, such reports or an address. I regret to state, that from some cause to me unknown, very few such reports, of any considerable importance, were made in writing. We have fortunately one source of supplying this public deficiency, and that is through our press. Both of our county papers give more than usual attention to the interests of the agriculturist, by well digested original articles frequently appearing in their columns, and excellent selections from various quarters of the country, applying the divine aid of science to that most ennobling of human pursuits. It may be said, that on agriculture is based the immense dependence for subsistence of all civilization, and in fact it becomes the source on which both commerce and manufactures are founded, and every thing connected with it tends to invest it with an almost sacred character. The course taken by our press, if generally followed, would place agriculture among the professions in science, where it properly belongs, and lead it up with them to their standard. Our farmers are now patronizing a number of agricultural papers liberally, which must result in great advantage, by awakening them to their business, and relieving them in a great measure from the public odium they now feel rests against manual labor.

Our plowing match that has usually exhibited a gratifying influence, was poorly represented in numbers. Only two teams entered, amount of land plowed one-fourth of an acre; time, one hour and a half. The plowing was done exceedingly well, and it would have been difficult to say which was best, although this is not our most leading pursuit. The plowing match has always excited, as much real interest and attention, as any department of our

Digitized by Google

fair, and few counties excel us in this branch of farming. I apprehend that more attention must be given by us in future, or suffer in this particular, from former exhibitions. The rain, no doubt was one cause for the decreased interest manifested, and that so few competitors were present.

A great variety of vegetables, fruits and flowers were presented, which were not entitled to premiums, from a want of any rule on the particular articles, and a sort of remissness in considering this part of our fair of less importance than it really is; yet very few present articles, of these kinds, with any kind of statistical information, about the variety, method of raising, amount raised on a given piece of ground, that is, vegetables, including also, grain, that committees are unable to discriminate, rendering this part of the exhibition rather uninteresting, to which I shall call attention at our next county meeting in February, and hope to secure some action that will result in stimulating future competitors. Much attention has been paid, for the last few years in our county to horticulture, and we have considerable fine fruit, and in large varieties, and by a little encouragement from our Society, there might be good displays at our fairs, not only in all kinds of fruit, but in all kinds of grain, as well as vegetables.

The whole amount of premiums awarded and paid at our late fair was, $149.38, and for incidental expenses, $20.58. Our account for the year stands as follows, viz:

By balance from last year, 1849,	$143 76
Cash for memberships in 1850,	87 00
Received from the State,	87 00
Total,	$317 76

To cash paid as premiums,	$149 38
For incidental expenses,	20 50
Balance on hand,	$147 88
Total,	$317 76

Officers for 1851.—Ebenezer P. Beck, of Sheldon, President; Leonard W. Smith, of Warsaw, Recording Secretary; Hugh T. Brooks, of Covington, Corresponding Secretary; John A. McElwane, of Warsaw, Treasurer.

EBENEZER P. BECK, *President.*

Sheldon, December 26th, 1850.

Digitized by Google

YATES.

The Annual Fair of the Yates County Agricultural Society, was held on the 4th and 5th, days of October, and was well attended. The weather was fine, and the show of stock was better, perhaps, than at any previous fair. Sixty-four head of cattle, (mostly native,) thirty-one horses, several pens of sheep, mostly French and Spanish merinos. Our farmers have paid but little attention to the improvement of the breeds of cattle in this county, hitherto; but an interest in that subject seems to be awakening in the minds of many, and they begin to find out that it costs no more to raise good stock than poor. Among the cattle, there was a pair of working oxen, the property of Benjamin Tuthill, Esq., of Starkey, which were the "observed of all observers," both for their quality and the perfect manner in which they were broke. Much has been done by our farmers to improve their flocks of sheep, and many fine flocks are being raised of the different imported breeds.

To avoid the charge of favoritism which is so often brought against committees, each article was numbered and the premiums awarded without the committees knowing the competitors. Some of our mechanics gave decided evidence of their skill, and I think the exhibition would compare favorably with any I have ever witnessed. The number of articles offered was one hundred and forty-eight. The show of plows, I think, was better than at any county fair I ever attended, among which were three different kinds of iron beam plows, decided favorites in this county.

The plowing match was well attended, and a good degree of interest manifested. Four teams were entered and such was the perfection of the work that the committee awarded a premium to each of the competitors, giving the preference to an iron beam plow, the Empire, manufactured in this place.

After the plowing match, a highly interesting and instructive address was delivered by Hon. M. H. Lawrence.

We have some things to regret, which are not peculiar to us alone, the unwillingness that many farmers and others manifest to exhibit their stock or other articles for competition, and the unwillingness of others to part with a certain article sometimes called the almighty dollar. We have to regret, above all the loss of the favor of the ladies. For years past, at every fair, the center of attraction has been the court house, filled as it has been with the evidence of woman's skill and industry, in which was manifested her taste for the beautiful, and her appreciation of the useful. This year there was no evidence from them that such a thing as a cow existed among

Digitized by Google

us, and appearances indicated the entire banishment of needle work from among them.

These things are not necessarily so, and woe betide us if they continue so, for there never has, nor ever will an association prosper and flourish without their countenance and support. The show of fruit and vegetables was fair, but not as good as at some former fairs.

Farming lands in our county have increased in price from fifteen to twenty per cent. within the past year, and there seems also to be an increased interest in agriculture, which we hope to see more fully developed at our next fair.

The receipts from all sources are, ...	$260 10
Premiums and expenses paid,.....	135 49
Balance on hand in Treasury, ...	$124 61

Officers for 1851.—Hon. Nehemiah Raplee, President; James Armstrong, Secretary; Fitz A. Stebbins, Treasurer.

CHARLES M. STARK, *President.*

Benton, February, 1, 1851.

CAYUGA.

At the Annual Meeting of the Cayuga County Agricultural Society, held at the court house in the city of Auburn, on Saturday, January 11, Col. William Howard, President, in the chair, and John B. Dill appointed Secretary. The chairman announced the object of the meeting was to elect officers of the Society for the ensuing year.

The report of C. A. Parsons, Esq., Treasurer, was received, read, accepted, and ordered on file.

On motion of C. Gridley, the meeting proceeded to the election of officers for the ensuing year, which resulted as follows:

President, Lyman Sherwood, Auburn: Vice-Presidents, Ira Hopkins, Auburn; James C. Reed, Aurelius; S. Bibbins, Brutus; S. Fancher, Cato; L. Colvin, Conquest; F. Bennett, Fleming; W. Adams, Genoa; John E. Terpinning, Ira; L. Hove, Locke; A. Howland, Ledyard; L. J. Hopkins, Mentz; L. Stowell, Moravia; S. Rooks, Niles; J. I. Brinkerhoff, Owasco; W. F. Cooper, Sterling; J. G. Wheeler, Sennett; R. Howland, Springport; J. S. Rathbun, Scipio; J. Barber, Summerhill; H. C. Tuthill, Sempronius; E. W. Bateman, Venice; D. S. Halsey, Victory: Executive Committee, J. M. Sherwood, Auburn; A. Underwood, Aurelius; J. Wright, Brutus; G. S. Tilford, Cato; David Schoolmaker, Con-

Digitized by Google

quest; Harvey Lyon, Fleming; J. Hall, Genoa; Levi Lewis, Ira; J. Sherman, Locke; A. Lyon, Ledyard; W. D. Osborn, Mentz; W. Wade, Moravia; L. Fuller, Niles; O. Howland, Owasco; John Neely, Sterling; John Page, Sennett; W. Richardson, Springport; W. King, Scipio; M. Bradley, Summerhill; J. Raymond, Sempronius; L. Murdock, Venice; S. Lockwood, Victory: Corresponding Secretary, John B. Dill, Auburn: Recording Secretary, H. H. Bostwick, Auburn: Treasurer, C. A. Parsons, Auburn.

On motion the meeting adjourned to meet at the call of the President.

J. B. DILL, *Sec'y.* W. HOWARD, *President.*

Auburn, Jan. 11, 1851.

MONTGOMERY.

Our Annual Fair was held at Fort Plain village, on the 11th and 12th of October. Extensive preparations were made for the exhibition, and the number in attendance was unprecedented. The show of horses was large and very fine. That of neat cattle was rather limited in number, and in breeds and quality showed no very decided improvement upon those of former years. This, however, may be attributed in part to the fact, that in the westerly towns of our county, (where the fair was held,) more attention is given to dairying, than to the raising of the choice and finer breeds of stock. The exhibition of sheep and swine was highly creditable, showing considerable improvement in these departments, and an increasing interest among our farmers, especially in woolgrowing.

The display of agricultural implements was unusually large, and gave evidence of a degree of skill and taste hitherto unequalled in our county; and of the fine carriages and sleighs upon the ground, it is not too much to say they would compare favorably with those of any other county in the State.

The dairying interests were also well represented by a large display of butter and cheese of the finest qualities.

Of the many varieties of the different kinds of fruit on exhibition it may suffice to say, all the specimens were highly satisfactory, and reflect much credit upon those who are so zealously devoting themselves to the useful and important branch of fruit culture.

The plowing match was in the afternoon of the second day, and owing to misapprehension as to the time, and the lateness of the hour, was not what it otherwise would have been; though there were several plows of improved patterns and great merit, used on the occasion, and furnished abundant evidence of the skill of our mechanics in the construction of this important

Digitized by Google

implement, and also of the fact that our farmers appreciate and understand their use. It is deemed proper here to remark, that the subsoil plow has been used by a very few of our farmers, and is beginning to attract considerable attention, though it is believed not to the extent which it deserves. There are probably but few farms in our county which have not more or less land with clay bottom, and which to ensure a fair crop, require breaking up to a greater depth than is practicable with the ordinary plow. The short crops, and in some cases entire failure so often witnessed on some portions of many of our farms, is doubtless owing to the impervious nature of the subsoil, causing the ground to bake and become hard in dry weather, and drowning and thus destroying vegetation in wet weather, both of which difficulties may be wholly obviated by the use of the subsoil plow.

Much is due to the farmers, mechanics, and others of our county, for the interest manifested in the promotion of agriculture in all its departments, and of the various mechanic arts, and while we cheerfully award to them their full share of credit, we would not be unmindful of the fairer sex whose contributions at our Fair decorated the interior of the large tent erected on the ground, making a magnificent display, eliciting universal admiration and applause, thus adding largely to the interest and enjoyment of the occasion.

An eloquent and instructive address by our esteemed fellow-citizen, C. B. Cochran, Esq., of Amsterdam, (published by request of the Society,) followed by a spirited discussion on the management of the different soils of our county, &c., and the election of officers for the ensuing year, closed our Fair, on the evening of the second day.

Amount of premiums paid,.....	$190 40
Cash on hand,.....	50 00

J. W. RIGGS, *President.*

Officers for 1851.—James Macintyre, Mohawk, President: John Nellis, St. Johnsville; Isaac Jackson, Amsterdam, Vice-Presidents: Stephen Sammons, Fonda, Secretary: Chester S. Brumley, Fonda, Treasurer: Simeon Sammons, Peter H. Fonda, John L. Haggart, Andrew J. Yates, Executive Committee.

Digitized by Google

COMMUNICATIONS.

ON THE JERSEY, MISNAMED ALDERNEY COW.

The following article, on the Jersey Cow, has been politely furnished for the Transactions of the Society, by the author, Col. J. Le Couteur, of Belle Vue, in the Island of Jersey. The history of this breed of cattle, which has long been celebrated for the quality of the butter which is produced from the milk, cannot prove otherwise than interesting and useful to our farmers. The efforts which have been made to improve the form and quality of the Jersey Cow, and which have proved entirely successful, may prove a stimulus to our dairymen to endeavor to improve and perfect a breed of dairy cattle, as suggested in the report on dairies, in the Transactions for 1849, (p. 306.) We have deemed it important to present the scale of points, which have, after careful examination and investigation, been adopted by the Royal Jersey Agricultural Society, in determining the prizes of the Society upon this breed of cattle. We accompany the report with an analysis of the milk of the Jersey Cow, by Professor Emmons, in connexion with analyses of the milk of other breeds, which show the very great richness of the milk of the Jersey Cow.

The Jersey Cow.—By Col. J. Le Couteur.

The breed of cattle familiarly known throughout Great Britain as the Alderney, and correctly termed in the article Cattle, of the "Library of Useful Knowledge," "the crumpled horned," was originally Norman, it is conceived, as cows very similar to them in form and color are to be seen in various parts of Normandy, and Britany also; but the difference in their milking and creaming qualities is really astonishing, the Jersey cow producing nearly double the quantity of butter.

The race is miscalled "Alderney," as far as Jersey is in question; for about seventy years since Mr. Dumaresq, of St. Peters, afterwards the chief magistrate, sent some of the best Jersey cows to his father-in-law,

Digitized by Google

the then proprietor of Alderney; so that the Jersey was already at that period an improved, and superior to the Alderney, race. It has since been vastly amended in form, and generally so in various qualities, though the best of those recorded at that period gave as much milk and butter as the best may do now.

Ten years have elapsed since the attempt was first made by fixed rules to improve the form and quality of the Jersey cow. A few gentlemen, presided over by the then Lieutenant-Governor, Major-General Thornton, selected two beautifnl cows, with the best qualities, as models. One of these was held to be perfect in her barrel and fore-quarters; the other equally so in her hind-quarters. From these two the following points were laid down to be the rule for governing the judges in all the cattle-shows of the Jersey Agricultural Society.

The accuracy of this arrangement is proved by the fact that no deviation from it has been made, the experience of ten years having only added to the scale, the points for general appearance and condition:

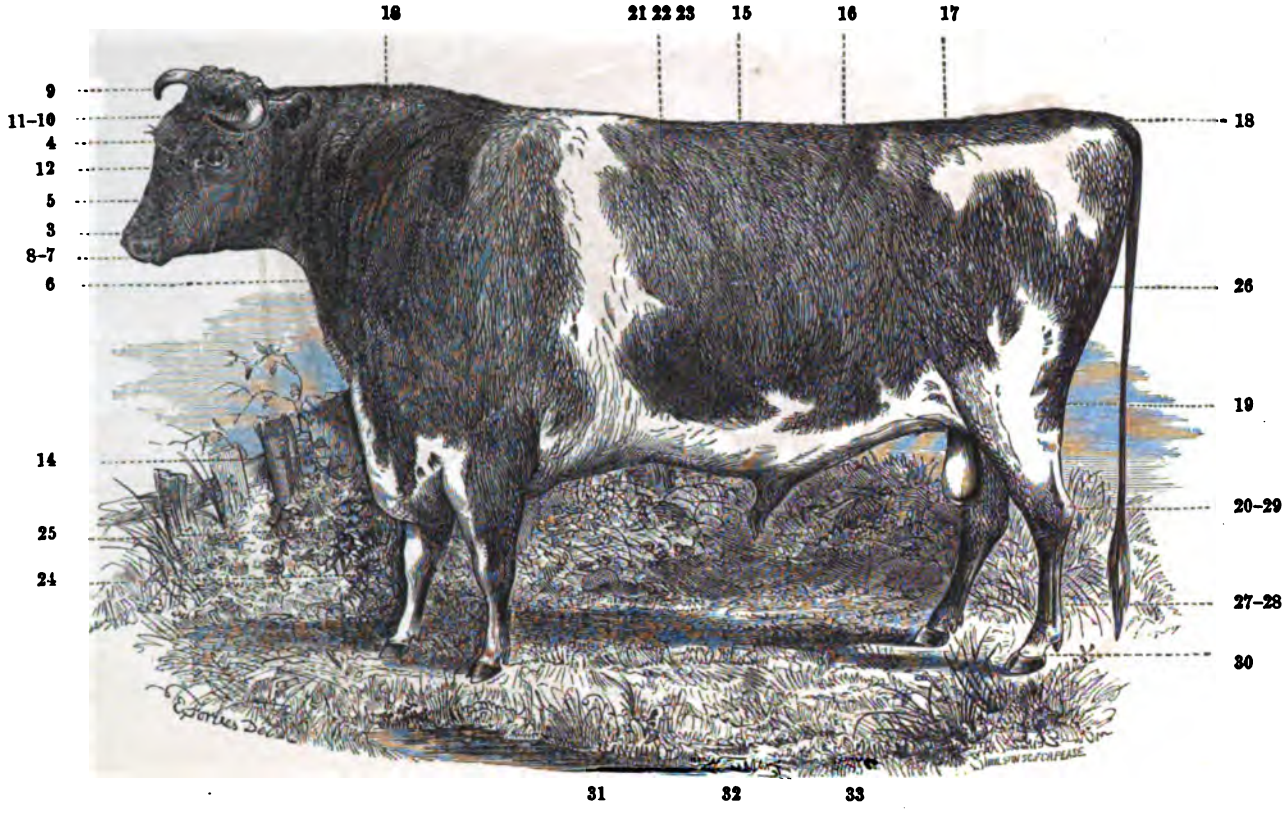
Scale of Points for Bulls.

The following is the scale of points which guide the judges in awarding the premiums on cattle:

Article.	*Points.*
1. Pedigree on male side,	1
2. Pedigree on female side,	1
3. Head, fine and tapering,	1
4. Forehead broad,	1
5. Cheek small,	1
6. Throat clean,	1
7. Muzzle, fine and encircled with a light color,	1
8. Nostrils, high and open,	1
9. Horns, smooth, crumpled, not too thick at the base and tapering, tipped with black,	1
10. Ears, small and thin,	1
11. Ears, of a deep orange color within,	1
12. Eye, full and lively,	1
13. Neck, arched, powerful, but not too coarse and heavy,	1
14. Chest, broad and deep,	1
15. Barrel hooped, broad and deep,	1
16. Well-ribbed home, having but little space between the last rib and the hip,	1
17. Back, straight, from the withers to the top of the hip,	1

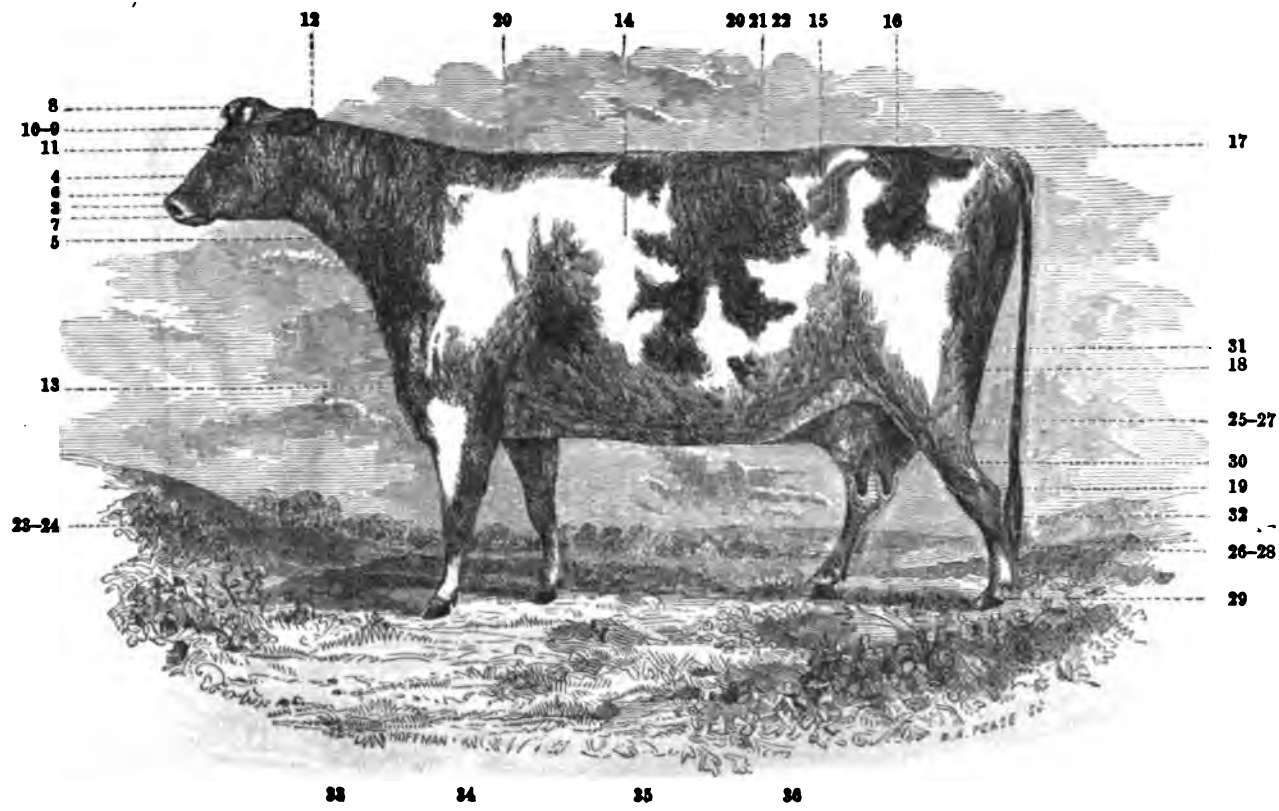
Digitized by Google

Digitized by Google



JERSEY BULL—PERFECTION, 33 Points.

Digitized by Google



JERSEY COW—PERFECTION, 36 Points.

Digitized by Google

Digitized by Google

18. Back, straight, from the top of the hips to the setting on of the tail; and the tail at right angles with the back,	1
19. Tail, fine,	1
20. Tail, hanging down to the hocks,	1
21. Hide, mellow and moveable, but not too loose,	1
22. Hide, covered with fine and soft hair,	1
23. Hide of a good color,	1
24. Fore-legs, short and straight,	1
25. Fore-arm, large and powerful, swelling and full above the knee, and fine below it,	1
26. Hind-quarters, from the hock to the point of the rump, long and well filled up,	1
27. Hind legs, short and straight (below the hocks) and bones rather fine,	1
28. Hind legs, squarely placed, and not too close together when viewed from behind,	1
29. Hind legs, not to cross in walking,	1
30. Hoofs, small,	1
31. Growth,	1
32. General appearance,	1
33. Condition,	1
Perfection,	33

No prize shall be awarded to a bull having less than twenty-seven points.

Scale of Points for Cows and Heifers.

Article.	*Points.*
1. Pedigree on male side,	1
2. Pedigree on female side,	1
3. Head, small, fine and tapering,	1
4. Cheek, small,	1
5. Throat, clean,	1
6. Muzzle, fine and encircled with a light color,	1
7. Nostrils, high and open,	1
8. Horns, smooth, crumpled, not too thick at the base, and tapering, tipped with black,	1
9. Ears, small and thin,	1
10. Ears, of a deep orange color within,	1
11. Eye, full and placid,	1
12. Neck, straight, fine, and lightly placed on the shoulders,	1
13. Chest, broad and deep,	1

Digitized by Google

14.	Barrel hooped, broad and deep,	1
15.	Well-ribbed home, having but little space between the last rib and the hip,	1
16.	Back, straight, from the withers to the top of the hip,	1
17.	Back, straight, from the top of the hips to the setting on of the tail; and the tail at right angles with the back,	1
18.	Tail, fine,	1
19.	Tail, hanging down to the hocks,	1
20.	Hide, thin and moveable, but not too loose,	1
21.	Hide, covered with fine and soft hair,	1
22.	Hide, of a good color,	1
23.	Fore-legs, short, straight and fine,	1
24.	Fore-arm, swelling and full above the knee, and fine below it,	1
25.	Hind-quarters, from the hook to the point of the rump, long and well filled up,	1
26.	Hind legs, short and straight (below the hocks) and bones rather fine,	1
27.	Hind legs, squarely placed, not too close together when viewed from behind,	1
28.	Hind legs, not to cross in walking,	1
29.	Hoofs, small,	1
30.	Udder, full in form, *i. e.*, well in line with the belly,	1
31.	Udder, well up behind,	1
32.	Teats, large and squarely placed, being wide apart,	1
33.	Milk-veins, very prominent,	1
34.	Growth,	1
35.	General appearance,	1
36.	Condition,	1
	Perfection,	36

Three points shall be deducted from the number required for perfection on heifers, as their udder and milk veins cannot be fully developed. A heifer will therefore be considered perfect at thirty-three points.

No prize shall be awarded to cows, or heifers, having less than twenty-nine points.

The evil was, and still exists, that most Jersey farmers, like many others, never thought of crossing with a view to improvement, conscious of possessing a breed excellent for the production of rich milk and cream—milk so rich in some cows that it seems like what is sometimes called cream in cities—and cream so much richer that, from a verdant pasture in spring, it appears like clouted cream. But the Jersey farmer sought no further. He

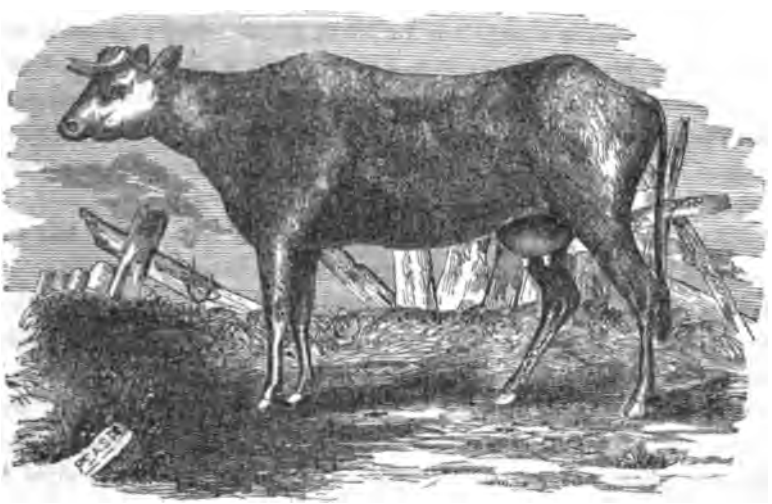
Digitized by Google

was content to possess an ugly, ill-formed animal, with flat sides, wide between the ribs and hips, cat-hammed, narrow and high hips, with a hollow back.

She had always possessed the head of a fawn, a soft eye, her elegant crumpled horns, small ears, yellow within, a clean neck and throat, fine bones, a fine tail; above all, a well-formed, capacious udder, with large swelling milk veins.

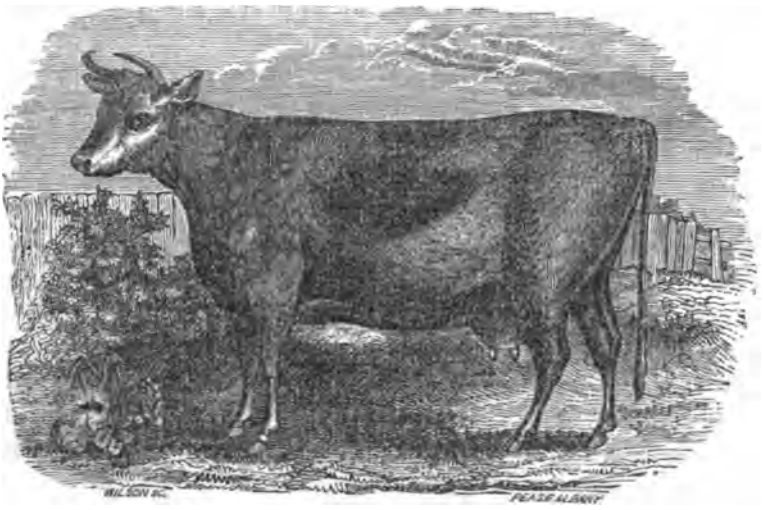
Content with these qualities, the only question in the selection of a bull, among the most judicious farmers, was, "Is the breed a good one?" meaning, solely, had its progenitors been renowned for their milking and creaming qualities? But the mere attention to this was one of primary importance in a circumscribed spot like Jersey; it may have been quite sufficient to establish a hereditary superiority in the most needful quality. It may also have established it with a rapidity that could not have been obtained in a wide extended country like France. Hence, perhaps, the present superiority of the Jersey over the French breed.

Some idea may be given of the difference in the form of the ancient and the improved breed by the following sketches:



The Old Jersey Cow, from 1800 to 1830, still to be seen in some pastures. The following points would be taken from her:—cheek large, 1; ewe neck, 1; hollow back, 1; cat-ham, 1; flat side, 1; not ribbed home, 1; hind legs crooked, 1; general appearance, 1;—in all, 8. These, deducted from 26, the number less the pedigree, leaves 18, which was about the average number the best cows had at the formation of the Society.

Digitized by Google



843, Portrait of "BEAUTY," a Prize Cow, four years old, bred by Colonel LE COUTEUR, at Belle Vue. She has already produced 11 lbs. Jersey, or 11 lbs. 13 oz. imp., of rich yellow butter, weekly in May, from 19 qts. of milk daily. She was awarded twenty-seven points, as a two-year-old heifer.

The Jersey cow is a singularly docile and gentle animal; the male, on the contrary, is apt to become fierce after two years of age. In those bred on the heights of St. Ouen, St. Brelade, and St. Mary, there is a hardiness and sound constitution that enables them to meet even a Scotch winter without injury; those bred in the low grounds and rich pastures are of larger carcass, but are more delicate in constitution.

Of the ancient race it was stated, perhaps with truth, that it had no tendency to fatten; indeed some cows of the old breed were so ungainly, high-boned, and ragged in form, Megs Merrilies of cows, that no attempt to fatten them might succeed—the great quantities of milk and cream which they produced probably absorbing all their fattening properties

Yet careful attention to crossing has greatly remedied this defect. By having studied the habits of a good cow with a little more tendency to fatten than others, and crossing her with a fleshy, well-conditioned bull, of a race that was also known to produce quality and quantity of butter—the next generation has proved of a rounder form, with a tendency to make fat, without having lost the butyraceous nature.

Some of these improved animals have fattened so rapidly while being stall-fed, from the month of December to March, as to suffer in parturition, when both cow and calf have been lost; to prevent which it is indispensable

Digitized by Google

to lower the condition of the cow, or to bleed, in good time. Such animals will fatten rapidly. Their beef is excellent; the only defect being in the color of the fat, which is sometimes too yellow. It is now a fair question, whether the improved breed may not fatten as rapidly as any breed known?

Quayle, who wrote the "Agricultural Survey of Jersey," states "that the Ayrshire was a cross between the short-horned breed and the Alderney."

There is a considerable affinity between these two breeds. The writer has noticed Ayrshire cows that seemed to be of Jersey origin, but none of them were said to have produced so large a quantity of cream or butter; nor was the butter in Scotland of nearly so deep a tinge of yellow as the most rich in Jersey. One Jersey cow that produces very yellow cream will give a good color to butter produced from two cows affording a pale-colored cream.

It is not doubted that crosses from the Jersey breed have taken place. Field-Marshal Conway, the governor of this "sequestered isle," as Horace Walpole termed it, and Lieutenant-General Andrew Gordon, who succeeded him, nearly half a century back, both sent some of the best cattle to England and Scotland. If pains were taken, the race and its consequents might be distinctly traced, which might lead to important results in breeding.

In the "Farmers' Series," at the article "The Angus Breed," a portrait of a beautiful heifer is seen; she is said to have been "out a very small cow, with a remote dash of Guernsey blood in her." Her dead weight was estimated at 130 or 140 stones. She sold for 50*l.*, after having obtained several medals, and had been publicly exhibited.

The grand desideratum is to discover a breed that will be useful to the grazier, the dairyman, and the small farmer. In so small a spot as Jersey, it is difficult to cross the breed essentially—a great step towards it is gained by crossing cattle bred in the low rich pastures with those of the exposed hills on the western or northern coast: these being smaller, finer boned, of a more hardy constitution, and feeding on a short rich bite, impart strength of constitution and hardihood to the larger and more delicate animals of the sheltered low grounds.

It is believed that cattle are generally more healthy and free from epidemics here than in most countries. This may be attributable in some measure to the saline particles which, being so frequently in suspension over the island, are afterwards deposited on the herbage, and tend to its salubrity. After heavy gales, it is frequently found that the grass all across the island has a strong saline flavor. So partial are cattle to this flavor, that they will greedily devour grass which has been watered with sea-water

Digitized by Google

which they previously rejected. Two pipes per acre, spread from an ordinary watering-cart, or from a pipe which may be made to pour into a long deal-box perforated with holes, will be found of great utility where sea-water or salt can be obtained at small cost.

The Jersey farmer treats his cow with gentleness and care; it might be more correct to say that his wife does so. On good farms she is usually housed at night after the end of October to the end of February, if heavy rain, hail, or snow prevail. It is deemed to be healthful to give a cow a short run daily through the winter, excepting in stormy weather. At this season, which is usually several degrees warmer than in the mildest part of Devonshire, she is fed with a certain portion of straw, from 10 lbs. to 20 lbs. of hay, with about 10 lbs. to 20 lbs. of parsnips, white carrots, turnips, or mangold-wurzel.

The small portion of grass which she may pick up in the winter, with the above quantity of food, enable her to produce a rich and well-colored sample of butter till within six weeks of parturition.

At this period, which is usually regulated to take place about the month of March or April, just when the cow, being in full milk, may soon be placed on the fresh spring pasture in April or May, she is an object of extreme care. On calving she is given a warm potation of cider, with a little powdered ginger. Quayle hints that pet cows are further indulged with a toast in their caudle.

The calf is taken from the cow at once, and fed by hand. It may be well to advise that on the first occasion of calving, the calf should be allowed to draw the cow fully; for no milking by hand will so completely empty the udder, nor cause the milk-veins to swell to their full development, as will the suction of the calf.

Some of the early meadows produce rich grass in March; but the general flush of grass, which comes on generally late in April, is the period when the Jersey farmer looks forward with anxiety. The cow is then tethered to the ground by means of a halter five or six feet long: this is appended by a ring and swivel to a chain which encircles her horns, closed by a ring and bar; the other end of the halter is fastened to a chain six or eight feet long, which is connected by a swivel and ring to a stout iron stake a foot long; this is driven into the ground by means of a wooden mallet. The cow having this circular range of twelve feet or more is compelled to eat it clean. She is usually moved thrice a day, and milked morning and evening, on many farms at mid-day also. Under this system, the writer has owned four cows that produced eight-and-forty pounds Jersey, or above fifty-one pounds

Digitized by Google

imperial, weight of rich yellow butter per week in the month of May and part of June.

In very hot weather, in July or August, it is advisable to shelter the cow from the heat and flies; otherwise these tease cows to such a degree, by forcing them to run about incessantly, that they have no time for repose and chewing the cud; they, in consequence, afford much less milk or cream.

It was anciently thought that cream from the Jersey cow was too rich for making cheese. Mr. Le Feuvre, of La Houge, who has a fine breed of cows, tried the experiment two years since, and succeeded to admiration. It was made from the pure milk, cream and all, as it comes from the cow. It was found that the quantity of milk that would have produced a pound of butter afforded one pound and a half of cheese.

From the quantity of milk which produced a cheese of twenty pounds weight, the *drainings* of the curds and whey, on being churned, yielded four pounds of butter. This butter was of an inferior quality when eaten with bread, but was superior to any other for the making of pastry; it was peculiarly hard, and of excellent texture for such use in hot weather. The writer has tasted cheeses from Mr. Le Feuvre's farm quite equal in quality to the richest double-Glo'ster.

On one or two farms besides General Fouzel's, butter is made from clouted cream in the Devonshire mode; but as this is not peculiar to Jersey, it is not noticed further than that ten pounds of butter are usually made in five minutes by this process. The usual way of procuring the cream is by placing the milk in pans about six inches deep, the glazed shallow earthenware having taken place of the unglazed deep vessels.

It is admitted that the richest milk and cream are produced by cows whose ears have a yellow or orange color within. Some of the best cows give twenty-six quarts of milk in twenty-four hours, and fourteen pounds of butter from such milk in one week. Such are rare. Good cows afford twenty quarts of milk daily, and ten pounds of butter weekly, in the spring and summer months. Butter is made every second or third day.

Lactometers indicate the degrees of richness, or cream, which the milk of any cow affords, with great nicety. This varies with different food. The mode is to fill the lactometer, up to zero with the first milk that is drawn from the cow in the morning; then, when the udder is nearly emptied, to fill a second lactometer with the residue of the milk, throwing a little out of the lactometer, to refill it to zero with the very last drops which can be drawn from the cow: these will be nearly all cream. The lactometer filled with the first milking may only indicate four degrees of cream, while that filled with the last milking may indicate forty degrees of cream. Then by dividing the sum

Digitized by Google

total,forty-four by two, we have twenty-two degrees of cream, which a very good cow will produce; others so little as ten or fifteen.

Jersey butter, made when the cows are partially fed on parsnips, or white carrots and grass, in September and October, when salted and potted will keep till the following spring, preserving as well as Irish butter, with a much less rank flavor.

(Col. Le Couteur informs us under date of June 15, 1850, that yearling bulls of the pure breed would be delivered at Southampton, England, from £10 to £12, and a yearling prize heifer at from £10 to £15—from $48 to $70 each.)

We have been furnished by Prof. Emmons with the accompanying analysis of the milk of a Jersey cow, imported from Jersey by John A. Taintor, Esq., of Hartford, Ct.

COMPOSITION OF THE MILK OF THE JERSEY COW.

BY PROFESSOR E. EMMONS, OF ALBANY.

The value of the milk of this breed of cows will be better understood by giving the analysis of the milk of one or two other breeds, for comparison. For this purpose, I shall copy the analysis of Prof. Thompson, of Glasgow, of the milk of the Ayrshires, which was made under the direction of the British government, for the purpose of determining the relative value of food in the production of butter. This cow was fed upon grass. The milk had a specific gravity of 1,029. It contained,

Water,	87 19
Dry matter,	12 81
Butter,	3 70
Casein,	4 16
Sugar,	4 35
Ash,	59

The Jersey cow, from whose milk the analysis was made is owned by J. A. Taintor, Esq., of Hartford, Ct., and a description of her condition and manner of feeding will be found in the letter of Mr. Taintor, which is annexed. The milk was sent by express and reached me in good condition. Its specific gravity was 1,031.3. It contained,

Water,	84 73
Dry matter,	16 27
Butter,	8 07
Casein,	5 02
Sugar,	3 05
Ash,	79

Digitized by Google

The butter was obtained by Ether. In order to test the correctness of the foregoing result, I set aside 16 oz. for thirty-six hours, and then creamed it. The temperature of the cream was 68° F. In churning, it thickened considerably, and required the addition of the skimmed milk to aid the movement of the cream. The butter by my mode of proceeding came in eight minutes, including delay, it should be set down as five minutes. The butter on its first appearance was in hard lumps and comparatively dry. It weighed 706.79 grains, equivalent to 9.33 per cent. Butter contains about twelve per cent of water, and nearly one per cent of curd. If a deduction is made for these items, the quantity of butter will correspond very closely with the amount obtained by ether.

According to the foregoing result, the milk furnished by the Jersey cow, owned by Mr. Taintor, will amount to 154 lbs. per week, and should yield 12.32 lbs. of butter. In Prof. Thompson's experiments, the yield of milk for sixteen days was 309 lbs. 14 oz. 6 dr., which gave 11 lbs. 14 oz. 11 dr. of butter. During an equal period, Mr. Taintor's cow will give 352 lbs. of milk, which will yield $28\frac{16}{100}$ lbs. of butter, giving a balance in her favor of about 18 lbs.

An Ayrshire cow, owned by a gentleman in this neighborhood, yielded me 516 grs. of butter per 16 oz. of milk. Milk taken from the cans of a milkman, which is regarded as good milk, gave 375 grs. of butter per 16 oz.

It may, however, be interesting to purchasers of milk, to subjoin the following analysis for comparison of the common milk with that of the Jersey or Ayrshire cows. Its composition is as follows:

Water,	90.48
Casein,	3.88
Butter,	2.88
Sugar,	2.78

The persons who use this variety of milk regard it as very good, no fault being found with it. A taste of the Ayrshire, and especially of the Jersey cow's milk, would probably impart one or two new ideas on the qualities of the milk they have been in the habit of using.

E. EMMONS.

Mr. Taintor's Letter.

E. Emmons, Esq., *Albany:*

Dear Sir—On my return home I have your favor of the 4th inst. I cheerfully comply with your request, and send you by express a bottle of Alderney milk.

My Alderney cows had a very long passage, and the hay having fallen short, they arrived in most pitiable condition, and have not yet fully re-

Digitized by Google

covered. The cow from which I shall send the milk, is five years old next June, recently calved, in poor condition, and has *only* been fed all winter on hay, with four quarts of bran daily. She gives now eleven to twelve quarts of milk in twenty-four hours, and the butter is far superior to any I have ever seen in this country. These animals I selected myself, as the very best, paying from 18*l.* to 25*l.* sterling for extra cows.

Very respectfully yours,

Hartford, Feb. 13, 1851. JOHN A. TAINTOR.

WIRE FENCES.

BY HAMILTON MURRAY, PRESIDENT OSWEGO AGRICULTURAL SOCIETY.

This mode of dividing farms and enclosing cattle, has been recently much discussed and extensively tried, with varied success. Having constructed some two hundred rods on my farm in various ways, and with entire satisfaction, and believing them worthy the attention of the farmers of this State, now that wood is becoming more valuable, and wire cheaper, I submit for compilation with the State Agricultural Society's Transactions, a mode of structure, which I have not seen reported, and originating with myself, after adopting various others recommended.

I would remark, that the fence so made, divided, during the fall of 1849, a wheat field from a pasture lot, in which some ten head of cattle, including rather an unruly bull, and, four horses were kept. This pasture lot was covered with natural grass, as it had never been tilled, and not an animal trespassed on the luxuriant field of fall wheat, during a season peculiar for its drought.

The wire used was *best quality No.* 9 *wire*, costing in New York city 5½ cents cash per pound. The posts used were chestnut, set 24 *feet* apart. The number of wires used was four. The posts, when set, were bored with a ⅝ inch bit; first hole, two feet from the ground; second, nine inches above that; third, nine above that; and fourth, one foot above that; designing to lay stone below the lowest wire. The first and last posts were thoroughly braced by a heavy twelve-foot rail, touching the post three feet from the ground, and well footed at the other end. The wire was secured to the first post, passed through the holes of all the others, say forty rods, (no matter how many,) and at the last, I used a "*winch*," made from a stick of green, hard wood, with the bark on, four feet long, and three inches in diameter at the large end. In that end I bored a similar hole, to pass the wire through, wound it around the stick by means of a handle, passed through an inch

Digitized by Google

auger hole at the other end, some six or eight times, till the winch became braced against the post, and the whole wire was made "taut." An attendant went to the far end and brought his weight to bear between every two posts in succession, and as he made "slack," I turned the winch as he raised his pressure. In this way, the whole line may be brought to *any degree of tension.* I then passed the winch around the post, turning off the wire on to it, and so secured it. In case of breakage this surplus wire may be unrolled, and used to form links with. I then took small red cedar pegs, and drove them into all the holes, on both sides of the posts, which serves to keep the wire steady, and the water out. But one wire in two fences so made has broken in eighteen months, and I have had occasion to take up no "slack" since it was put up.

Now for the cost, as per my address before the Oswego County Agricultural Society.

"One hundred rods of fence will cost as follows:

66 posts set, at 14 cents,.....	$9 24
400 lbs. wire, of best quality, which I call on the farm 7 cents for 4 wires high, ...	28 00
Putting through posts,.....	2 76
	$30 00

Or 30 cents per rod.

You thus have a fence at once neat, durable, using no ground, and not liable to be acted on by winds, costing not more than 'a worm rail fence,' which is constantly affected by the winds and decay, besides taking in the hundred rods a mile of land one foot wide.

POTATO DISEASE.

BY GARDNER COX, EAST PIERREPOINT, ST. LAWRENCE COUNTY, N. Y.

The following suggestions, upon tho perplexing subject of the potato disease, are presented for your examination, and if they should be found to contain principles worthy of a place among the papers of your Society, they are at your disposal.

Having had the pleasure of examining many of the papers that have come up in the form of reports to the Agricultural Society, upon the subject of the potato disease, I am induced to believe that too much of the calamity complained of has been attributed to bad seed and mismanagement in farming. That high and scientific cultivation of the potato plant is important

Digitized by Google

for the purpose of improving both in quality and in quantity, cannot be denied; but that the external influences that turn the wheels back, after the vital forces of assimilation have ceased to operate, I think is the result of fixed laws.

The following theories, selected from different standard chemical works of the day, seem to cast some light upon the subject. Chemistry considers the relation of particles to each other. It investigates the properties and qualities of different kinds of matter, their mutual influence, and the action of the imponderable principles upon them. It treats of the causes of those invisible movements which the molecules of bodies around us unceasingly undergo. Every change taking place in bodies is due to the operation of some active force. It is one of the first principles of philosophy, that no movement or mutation ever occurs in any thing spontaneously—we must always refer it to a disturbing cause. Under the influence of heat, bodies increase in size; under that of electricity, some are dissevered into their component elements; under that of light, vegetables form from inorganic material their organized structures. We can form no idea of the properties of bodies disengaged, from the influence of these principles. Thus, we find all material substances existing under one of these conditions, solid, liquid, or gaseous; and the majority can assume either of these conditions, under the influence of heat. We see, therefore, that it is the degree of heat to which it is exposed which determines its physical state. The problem which the chemist has to solve, is that of determining the true condition of matter—not of matter in the abstract, but as placed under the influence of these external powers. All the phenomena of chemistry, prove that material substances consist of indivisible and exceedingly minute portions or atoms, which are placed at certain distances from one another, those distances being variable, and determined by the agency of active forces. As all bodies contract during the act of cooling, we infer that the particles of which they are composed are separated from each other by intervening spaces, and that these spaces may be varied at the pleasure of the experimenter. Now it is inconceivable, that this phenomenon should ensue unless the several particles approached each other; but such an approach would be impossible if they were already in contact, for two particles could not occupy the same place at the same time. It is worthy of observation, that by proper means these interstitial spaces may be greatly increased or diminished, and in many instances without any striking apparent change occurring in the substance under experiment.

With these facts before us, we now direct our attention to the properties of atoms. That the atoms of which bodies are composed are exceedingly

Digitized by Google

small, we possess abundant proof. The world of organization furnishes us with striking proofs to this point. There exist animalcules of which it would require many millions to make up the bulk of a common grain of sand; yet these are furnished with digestive and respiratory organs, with circulating juices, and with contrivances as elaborate as the mechanism of the highest order of life. All the results of chemistry prove, that the ultimate atoms of bodies are unchangeable and imperishable. We cannot effect their destruction, or impress with new or unusual qualities, any more than we can call them into being. Those familiar instances in which it appears that material substances are destroyed or dissipated, when rightly understood, are only cases of transformation, or the origin of new compounds. An atom, once created, can by no process be destroyed.

Having thus spoken of the atomic constitution of matter, let us now direct our attention to the intervening interstices. The distances that part the atoms of a given mass from one another are not casual, or determined at random—their magnitude is perfectly regulated. To produce these results, two forces are required—first, a force of attraction; and, second, a force of repulsion. The distance at which they are placed at one moment, is determined by the balancing of these forces. If the attractive force is made to increase in intensity, the particles approach; if the repulsive, they recede. From experiments we gather that the spaces through which molecular attraction and repulsion can act are very limited, and it follows, of necessity, that the interstices which separate the atoms of bodies are exceedingly minute, for through those spaces the action of these forces extends. If the limiting distance through which molecular attraction and repulsion can reach is, as there is reason to believe, from some of the experiments of Newton, less than the millionth of an inch, we are entitled to conclude that the interstitial spaces are much smaller. The combination of these atoms seems regular and of fixed proportions. When substances combine with each other, and give rise to new products, the union takes place by the atoms of the one associating themselves with the atoms of the other, and as these atoms possess weight and other properties which are specific, there are certain circumstances easily foreseen, which must attend such combination. The constitution of a compound body must always be fixed and invariable. This arises from the fact of the unchangeability of the properties of atoms; one atom of water will always be composed of one atom of oxygen and one of hydrogen; one atom of carbonate of lime will always consist of an atom of carbonic acid and one of lime; or, more generally, a good analysis of water has shown that nine grains of that substance contain eight grains of oxygen and one of hydrogen; every subsequent analysis will cor-

Digitized by Google

respond therewith. I have gathered the above theories principally from Draper, for the purpose of ascertaining, if possible, the possibility of vegetable plants degenerating, or whether the atoms of which they are composed are likely to lose their original qualities.

Let us now examine the laws of the assimilation of vegetable plants, and the fixed laws which seem to regulate their growth. Vitality is the power which each organ possesses of constantly reproducing itself; for this it requires a supply of substances which contain constituent elements of its own substance, and are capable of undergoing transformation. All the organs together cannot generate a single element. Although the vital principle exercises a great power over chemical forces, yet it does so only by directing the way in which they are to act, and not by changing the laws to which they are subject. Hence, when the chemical forces are employed in the process of vegetable nutrition, they must produce the same results which are observed in ordinary chemical phenomena, during the progress of growth. Plants appropriate carbon in the form of carbonic acid, which is accumulated from the atmosphere, and hydrogen from the decomposition of water, the oxygen of which is set free, together with a part of all that is contained in the carbonic acid. The range of affinities possessed by both these elements is so extensive that numerous cases occur which effect the decomposition of water, and the combination of the carbon from carbonic acid. Liebig has it thus with relation to woody fibre—"The woody fibre can only be formed in one of two ways: either the carbon of carbonic acid unites directly with water, or the hydrogen of water combines with the oxygen of the carbonic acid. In the former of these cases, the two equivalents of oxygen in the carbonic acid must be liberated; in the latter, two atoms of water must be decomposed, the hydrogen of which unites with the oxygen of the carbonic acid; whilst the oxygen of the water, thus set free, is disengaged in the state of a gas." The process of assimilation, in its most simple form, consists in the extraction of hydrogen from water, and carbon from carbonic acid, in consequence of which, all of the oxygen of the water and carbonic acid is separated. The composition of organic compounds most generally present in vegetables, enables us to state in definite proportions the quantity of oxygen separated during their formation—36 eq. carbonic acid, and 22 eq. hydrogen, derived from 22 eq. water, with the separation of 72 eq. oxygen (woody fibre), 36 eq. carbonic acid, and 36 eq. hydrogen, derived from 36 eq. of water, with the separation of 72 eq. oxygen (sugar), 36 eq. carbonic acid, and 30 eq. hydrogen, derived from 30 eq. water, with the separation of 72 eq. oxygen (starch). We can explain, in a similar manner, the formation of all the compound substances of plants

Digitized by Google

which contain no nitrogen. As the potato contains a very limited portion of nitrogen, I shall not say much of its assimilation. We cannot suppose, however, that a plant can attain maturity, even in the richest vegetable mould, without the presence of matter containing nitrogen. I would refer the reader to Liebig's Agricultural Chemistry, page 30, upon this subject. The increase of mass in a plant is determined by the occurrence of a decomposition which takes place in certain parts of the plant under the influence of light and heat. In the vital process, as it goes on in vegetables, it is exclusively inorganic matter which undergoes this decomposition. The process of formation and growth, in other words, the passage of matter from a state of motion to that of rest, goes on in the same way in animals and vegetables, in both, the same cause determines the increase of mass. A plant is, however, destitute of nerves. Heat and light are the remote causes of motion in vegetables; but in animals we recognize in the nervous apparatus a source of power capable of renewing itself at every moment of their existence.

While a plant lives, we cannot perceive any cessation in its growth; no part of an organ in the plant diminishes in size. If decomposition occurs, it is the result of assimilation. A plant produces within itself no cause of motion, it must originate from an external cause. The cause of the state of rest is a resistance determined by a force of attraction, (combination) which acts between the smallest particles of matter and is manifested only when they are in actual contact, or at infinitely small distances; these attractions chemists call affinities.

From the above scientific considerations we observe a law approaching to a fixed system of nature, although we may not understand all its hidden mysteries. We shall now examine the laws of decay and putrefaction. All those substances destitute of nitrogen, which appear to possess the property of entering spontaneously into fermentation and putrefaction, do not in reality suffer those changes without some previous disturbance in the attraction of their elements. Bodies containing nitrogen possess the power of entering into transposition of their elements, as soon as they cease to form part of a living organism; that is, when they are drawn out of the sphere of attraction, in which alone they are able to exist, decay or (eremacausis,) always precedes fermentation and putrefaction, and it is not until after the absorption of a certain quantity of oxygen, that the signs of a transformation in the interior of the substance show themselves. It is a general error to suppose that organic substances have the power of undergoing changes spontaneously, without the aid of an external cause. When they are not in a state of change, it is necessary before they can assume

Digitized by Google

that state, that the existing equilibrium of their elements should be disturbed; and the most common cause of this disturbance is undoubtedly the atmosphere which surrounds all bodies.

As the bulb of a potato contains little else than carbon, oxygen and hydrogen, in their relative proportions for forming water, I shall confine my remarks to these compounds. There are two affinities at play in these bodies, one of these affinities is the attraction of the oxygen of the air for the hydrogen of the substance, and the other is the affinity of the carbon of the substance for its oxygen, which is constant under all circumstances. The carbon constantly inclines to unite, with oxygen to form carbonic acid, the hydrogen in the same manner to form water, or with the nitrogen to produce ammonia; and the tendency may be satisfied in a variety of ways. Elevations of temperature in the open air at once give rise to carbonic acid, water and free nitrogen; the causes that produce these chemical actions are next to be considered. Prof. Potter says, all vegetable and animal substances are liable to decay, this is owing to certain affinities which the different principles composing these substances have for each other, and for surrounding bodies, stronger than those which had previously united them, and which inclined them as soon as the living principle is extinct, to decompose and form new compounds. Thus the carbon and hydrogen which are found in all organized bodies tend to appropriate to themselves so much oxygen as shall convert them into carbonic acid and water; in the case of animal bodies, this tendency to decomposition is stronger than in vegetables, since in addition to the principles just named, which they have in common with all vegetables, they contain nitrogen or azote, an element not found in most plants, and which has a strong affinity for all the above principles, especially for hydrogen. This disposition to decay, though it exists from the moment the vital principle is extinct, will not so soon manifest itself without the aid of moisture, air and a certain temperature. It is well known in the first place, that substances kept in moist situations putrify much sooner than those kept in dry; the water probably acts by softening the texture, and thus counteracting the agency of cohesion—which tends to keep the substance in its original state; a part of the effect may be owing also to the affinity of the water of some of the products of putrefaction. Hence the importance of excluding all substances, which we would preserve, from moisture. In warm seasons and in hot climates every thing tends to corruption, the heat acts, perhaps, by tending to separate from one another, elements which are already combined. The temperature most favorable to putrefaction, is between sixty and one hundred degrees. A strong heat is unfavorable by expelling moisture and a cold of thirty-two

Digitized by Google

degrees, or the temperature at which water freezes, arrests its progress altogether. We know, says Liebig, that as long as plants exhibit the phenomena of life, oxygen gas is given off from its surface, that this oxygen is altogether without action on the constituents of the living plant, for which in other circumstances it has the strongest attraction.

The plant increases in mass until the vital force inherent in it comes into equilibrium with all the other causes opposed to its manifestation; from this period every new cause of disturbance, added to those previously existing (a change of temperature for example,) deprives it of the power of offering resistance and it dies down. In the living plant the intensity of the vital force far exceeds that of the chemical action of oxygen. We know, with the utmost certainty, that by the influence of the vital force oxygen is separated from elements to which it has the strongest affinity, that it is given out in the gaseous form without exciting the slightest action on the juices of the plant. This intensity of action or resistance the plant obtains by means of the sun's light, (the cause of the fixation of its carbon,) the effect of which in chemical actions may be, and is compared to that of a very high temperature. During the night an opposite process goes on in the plant. We see then, that the constituents of the leaves and green parts combine with the oxygen of the air, a property which in daylight they did not possess.

From these facts we can draw no other conclusion than this, that the intensity of the vital force diminishes with the abstraction of light, that with the approach of night a state of equilibrium is established, and that in complete darkness, all the constituents of plants which during the day possessed the power of separating oxygen from chemical combinations and resisting its action, loose the power completely. But neither the emission of carbonic acid nor the absorption of oxygen, has any connection with the process of assimilation, nor have they the slightest relation to one another, the one is a purely mechanical and the other a chemical process; the carbonic acid which has been absorbed by the leaves and roots together with water, ceases to be decomposed on the departure of day-light. It is dissolved through the jucies and escapes every moment through the leaves. What degree of temperature will separate the particles of the different kinds of root vegetables sufficient to admit the oxygen of the atmosphere may not be correctly understood.

Liebig says, there is no example of carbon combining directly with oxygen at common temperature, but numerous facts show that hydrogen, in certain states of condensation, possesses that property; that there is a division line between thirty-two and one hundred degrees there can be no doubt. Pot-

Digitized by Google

ter thinks that sixty degrees is near the temperature where the absorption of a certain quantity of oxygen will show itself in the interior of the substance, but at this temperature chemical transformation will be very slow, but will increase in rapidity with increase of temperature. That uncommon damp and moist situations will produce the same chemical changes by softening the texture, and thus counteracting the agency of cohesion, is known to be a fact beyond a doubt. I think that the potato will not be materially affected by any chemical agency between thirty-two and sixty degrees, after the vital force has brought it into a state of equilibrium, unless surrounded by uncommon moisture. I have thus far quoted largely from standard works.

I will now ask the question, can there be anything done to prevent the prevailing calamity? I would answer, first, that sound healthy seed for the commencement would be important. Second, the selection of suitable fields or soil, for many conditions are necessary for the life of plants, those of each genus require special conditions, and should but one of these be wanting, although the rest be supplied, the plants will not be brought to maturity. If we knew with certainty the substances capable of nourishing a plant and bringing it to maturity, we might be led to a knowledge of the conditions necessary to the life of all plants, by studying their composition. The development of every part of a plant in a free and uncultivated state, depends on the amount and nature of the food afforded it by the spot on which it grows. A plant is developed on the most sterile and unfruitful soil, as well as on the most luxuriant and fertile; the only difference which can be observed being in its height and size, in the number of its twigs, branches, leaves, blossoms and fruit. Whilst the individual organs of a plant increase on a fertile soil, they diminish on another, where those substances which are necessary for their formation are not so bountifully supplied. We must know, if possible, what substances the soil contains, and what are the components of the substances in the plant we wish to cultivate. Until these points are satisfactorily determined, a rational system of agriculture cannot exist. We must proceed in the culture of plants in precisely the same manner as we do in the fattening of animals, and in so doing we shall increase the quantity and quality, for precisely the same result will follow in both cases; in supplying the necessary food to plants, we shall keep up the vital force which will resist the chemical influences of oxygen. But before we shall be able to understand the whole subject, the power and knowledge of the physiologist, of the agriculturist, and chemist, must be united for its complete solution. Third, a chemical action is not liable to take place while the potato is in process of growth,

Digitized by Google

but if it should, by some cause, aside from the common course of nature, the assimilation must first be arrested, for the wheels cannot turn opposite ways at the same time. If the mechanics step aside from their work of assimilation, the oxygen may commence the destruction of the organised compound, there will be no means within our reach to provide for this calamity. But if the vital force of assimilation should be kept up until the plant is brought to maturity, and the temperature of the soil when the potato is growing is below sixty degrees (F.,) they will not suffer a chemical change, unless there is uncommon moisture about the plant. But if the temperature of the soil should rise above sixty degrees (F.,) and the field uncommon moist, and likely to remain so for any length of time, the gathering of the crop would undoubtedly be preferable, if they could be stored in a cool, dry, and dark cellar, where the temperature is below sixty (F.,) and a circulation of air permitted to pass through them sufficient to prevent the separation of the gas.

My experience upon the subject is this. In the summer of 1846, I erected a cellar sufficiently large to hold eight thousand bushels of potatoes, and stored that fall seven thousand, averaging about eight feet deep. The cellar was built upon the north side of a hill sufficiently high to admit of two ventilations to enter beneath the floor of the cellar; timbers were laid crossways upon the bottom of the cellar, and boards laid upon them about eight inches wide and one inch apart, admitting the cold fresh air to circulate under the whole body of potatoes. The result has been that my stock has been preserved; no chemical action has been discovered to work the work of decay. Potatoes which were diseased when stored, have been arrested from further decay, and the diseased part of the potato dried down and the sound part preserved. This experiment has been tested with the same result for the last four years.

Fourth, what influence on all the change that will take place in hoeing plants, in the absence of light, perhaps may not be directly known; but we know that the accumulation of carbon will not take place in the absence of light; that a plant in complete darkness cannot decompose carbon, as shown by Liebig, and in total absence of light, in (a warm sultry night for example,) the constituents of the leaves and green parts, (or feeders,) of the plant will combine with the oxygen of the air, a property which in daylight they do not possess, and this combining of the oxygen may be so complete as to carry the plant beyond the recovery of its assimilation. When this takes place it will first be discovered by the drooping of the leaves, buds, or green parts that are on the stock of the living plant, and if continued any length of time, with high temperature, the vital force will be wholly de-

Digitized by Google

stroyed, but these influences are confined principally to the more tender plants. Draper thinks that the Tithonic rays, which are always associated with light, have a decomposing effect upon many substances, but that the decomposing will be precisely proportioned to the quantity of rays absorbed. If this is so, the potato may and will suffer under this influence after being gathered, unless secured from its influence. I presume it will not be doubted that potatoes of the first class, after having been exposed to the light for any considerable length of time, will lose their rich qualities, and hence the necessity of providing for this calamity.

Recapitulation.

First, the eremacausis of such substances analogous to the putrefaction of azotised bodies have two affinities; the affinity of nitrogen for hydrogen, that of carbon for oxygen, and both facilitate the disunion of the elements, and two affinities also in action in those bodies which decay with the evolution of carbonic acid, the affinity of the oxygen of the air for the hydrogen of the substance which corresponds to the attraction of the nitrogen for the same element; and the other is the affinity of the carbon of the substance for its oxygen. This emission of carbonic acid (which is C. E. Goodrich's dry rot,) will not take place below fifty-five or sixty degrees of temperature. The chemical combination of oxygen with hydrogen may take place in a temperature as low as forty-five or fifty degrees, for the reason that moisture is another agent with heat employed to soften and separate the atoms of the substance, sufficient to admit the oxygen of the air to act upon the internal organs of the tubers; this is the water or the wet rot.

I think these chemical combinations in their varied modifications cover the principal grounds of the potato disease, while they are in the ground, but these chemical forces are all arrested while the plant is in the process of growth by the vital force inherent in it, the one being mechanical and the other chemical. But external causes such as frost, rust, or dark nights, with high temperature will destroy the mouths and stomachs of assimilation and arrest the growth of the plant, and leave it in a state of equilibrium, but they cannot turn the wheels back, another influence must do this work, the chemical action of the oxygen. It can be readily foreseen that if we possess ourselves of the chemical and mechanical decompositions and transformation of the different families of plants, we can assist their production and preservation, and they will respond to our care, if applied in the beaten track that nature has marked out for us to follow.

Digitized by Google

ANALYSIS OF THE JERUSALEM ARTICHOKE.

BY J. H. SALISBURY, M. D.

Vegeto-chemical analyses are instituted for the purpose of ascertaining either quantitatively or qualitatively the proximate and ultimate organic and inorganic constituents of the whole plant, and its several parts. It is requisite in studying the physiology of plants, that equal attention be paid to these three kinds of analysis, for there is a great distinction between the chemistry of inorganic and organic bodies; that in the former case the determination of the proximate principles can be inferred from that of the ultimate constituents, while in the latter case no such rule holds good. Hence these methods of analysis must be conducted separately and distinctly.

In the examination of any given plant special attention should be directed to the percentage of inorganic matter, organic matter and water in the different proximate organs, as the root, stem, leaves, &c., separately, and in the whole plant. This gives us not only the percentage of water, dry matter, and inorganic matter, in the whole plant, but also, the percentage of these in the several organs individually.

To illustrate its practical bearing, suppose the plant in view is one commonly cultivated for food, for instance maize. We determine in a fresh plant when ripe, the aggregate amount of water, dry matter, and inorganic matter which that plant contains. Suppose the average of each plant to be one pound, one hundred plants would weigh one hundred pounds. These one hundred plants or one hundred pounds, contain of water, 15 lbs.; organic matter, 81 lbs.; inorganic matter, 4 lbs. Suppose one acre of land to produce six tons of plants, which is a fair yield. These six tons, would contain of water, 1,800 lbs.; organic matter, 9,710 lbs.; inorganic matter, 480 lbs. The percentage of inorganic matter, interests us particularly in this preliminary examination, for the reason, that we know that the plants obtain it entirely from the soil. There must be in the soil all the inorganic ingredients that we find in the plants and the plants must derive all the inorganic matter they contain from the soil; hence we must find in the acre of soil, after the crop is removed, 480lbs. less of inorganic matter, than it contained before the plants were grown upon it. If this acre be cropped with this plant for a series of twenty years, without any inorganic matter being added, there will be removed 9,600 lbs. Hence the soil will contain 9,600 lbs. less of inorganic matter than it did previous to the cropping. Hence we notice, that the soil is gradually but actually exhausted of its inorganic matter at the rate of 480 lbs. per year. If we add, however, 480 lbs.

Digitized by Google

yearly to the soil, its weight will not decrease, because we return yearly the amount taken away. But in adding inorganic matter, we may not furnish the soil with the precise ingredients which the plants remove, as we have not yet determined the constituents of the inorganic matter removed by the crop. Our next step then is to determine accurately the composition of the inorganic matter.

This will give us the amount of each ingredient removed. If we crop our soil for a series of years, and wish this cropping not to exhaust, impoverish, or render it poorer in inorganic constituents, and consequently less productive, we must add yearly something which will furnish it with the amount of each ingredient removed, and this can be done by adding in a soluble form, so as to be taken up by the plants, the fertilizing materials which will restore the exhaustion which has been made.

It is not intended to convey the idea that inorganic matter is more important to the growth of a plant than organic, or that organic matter performs a more important office than inorganic. The fact is, both are necessary, and both may be considered as equally important. But the inorganic matter which a plant contains, we know is derived entirely from the soil, while the organic matter, as far as known, is derived both from the soil and air. Therefore, the reason why we add a given quantity of each of the inorganic bodies before referred to, yearly, to the soil, is that they are the bodies, the aforesaid quantities of which are removed by a single crop, and we add them to the soil to return what is taken away. Hence the inorganic analysis of a plant is made to throw light upon the process of its culture. The proximate and ultimate organic analyses, however, are not made so much to throw light upon the process of its culture, as those of the inorganic, but more for the purpose of arriving at its nutritive powers, and the bodies which it may contain, that may be usefully applied in the arts or medicine, and to give us a better idea of its physiology.

What has been said in relation to maize, is merely to illustrate briefly the practical value of the analysis of plants in agriculture.

ANALYSIS OF THE JERUSALEM ARTICHOKE, (*Helianthus tuberosus.*)

This plant is interesting at this time to cultivators, as an article to take in part, for feeding, the place of the potato, which at present is quite unsafe and unprofitable to cultivate, to any considerable extent, on account of its liability to disease. The tendencies to this diseased state have been rapidly increasing, year after year, till now cultivators grow this plant with a careful, sparing, and almost faithless hand. Notwithstanding the many earnest interrogations put by the observer, its disease seems still to remain as much of an unsolved enigma to physiologists as ever.

Digitized by Google

It has been so extensively grown, on account of its cheapness, ease of culture, nutritious powers, and adaptation as food for animals and men, that its partial loss through disease has been and still will be deeply and seriously felt, unless the disease abates, or some substitute, or partial one can be found. One and the main object of making the following examinations of the artichoke, was to determine whether it had in composition any claims to qualities which would recommend it as a partial substitute for the potato in feeding stock. It has proved much richer in fat forming principles and nitrogen bodies than was at first supposed. In the first place, the percentages of water, dry matter, and ash, were separately determined; secondly, the composition of the ash; and thirdly, the organic matter was examined, and the percentage of fat and muscle forming products ascertained.

The white and red Jerusalem artichokes have both been examined. The white variety was raised on the flats, just north of Albany, and furnished by Mr. Sanders, the red on the island, just south of Albany, and furnished by Mr. E. McGrath. The tubers of the white variety were much larger than those of the red. The size of the white tubers were as follows: length four inches, diameter two and a half inches. The average length of the red tubers was about five inches, their diameter one inch.

Percentage of water, dry matter, and ash:

	White tubers.	Red tubers.	Tops of red variety
Water,.....	83.608	68.35	40.08
Dry matter,.....	16.392	31.65	59.92
Ash,.....	.774	1.352	3.85
Ash calc. on dry matter,.....	4.728	4.27	6.425

It will be noticed that the white variety contained 83.608 per cent. of water, while the red has but 68.35 per cent. The tubers of the white variety were of a much larger growth than those of the red, and were more succulent and tender. The mean per cent. of water of the two varieties is 75.979, which is equal to about the mean per cent. of water in the potato tuber.

In the fresh tubers, the percentage of inorganic matter is less in the white than in the red variety; but in the dry tubers, the percentage of ash is greatest in the white kind. One ton of the fresh tubers of the white variety takes from the soil 15.48 lbs. of inorganic matter. One ton of the fresh tubers of the red kind removes 27.04 lbs. of ash or inorganic matter; and one ton of the tops take up 77 lbs.

An acre of soil would grow about 45,000 plants. These 45,000 plants have of stalks or tops about 11,250 lbs., or 5.62 tons. In a good crop, the weight of the tubers of each plant would average at least one-third of a

Digitized by Google

pound. An acre, then, would produce about 15,000 lbs., or 7½ tons. The tubers would be removed for feeding, the tops generally would be left on the soil. The 7½ tons of tubers of the white variety remove from the soil about 116 lbs. of inorganic matter; 7½ tons of tubers of the red variety remove about 203 lbs.; 5.62 tons of tops take from the soil of inorganic matter about 433 lbs.

We know now the aggregate amount of the inorganic matter which a given weight of tubers or tops will require.

Our next step is to inquire into the composition of this inorganic matter, so that we may be able to add to our soil what is taken away. The following is the composition of the inorganic matter of the tubers and tops:

	Ash of tubers. White variety.	Ash of tubers. Red variety.	Ash tops of Red variety.
Carbonic acid,	21.75	23.10	trace.
Silicic acid,	1.60	1.40	26.55
Phosphoric acid,	9.75	12.05	11.10
Phosphate of iron,	1.20	1.25	3.25
Lime,	1.95	3.35	18.30
Magnesia,	0.55	0.30	8.85
Potash,	42.20	43.65	11.40
Soda,	15.25	6.60	15.85
Chlorine,	2.55	2.65	0.85
Sulphuric acid,	1.95	4.45	4.05
	98.75	98.80	99.60

The 116 lbs. of inorganic matter, in the 7½ tons of white tubers, contain of

Carbonic acid,	26	pounds.
Silicic acid,	2	do
Phosphoric acid,	11½	do
Phosphate of iron,	1½	do
Lime,	2	do
Magnesia,	1	do
Potash,	49	do
Soda,	18	do
Chlorine,	3	do
Sulphuric acid,	2	do
	116	do

Digitized by Google

The 203 lbs. of inorganic matter in the 7½ tons of the tubers of the red variety contain,

Carbonic acid,	47½	pounds.
Silicic acid,	3	do
Phosphoric acid,	25	do
Phosphate of iron,	3	do
Lime,	7	do
Magnesia,	1	do
Potash,	89	do
Soda,	13½	do
Chlorine,	5	do
Sulphuric acid,	9	do

The 433 lbs. of inorganic matter, taken up by the 5.62 tons of tops, contain of

Carbonic acid,	trace.	
Silicic acid,	115	pounds.
Phosphoric acid,	48	do
Phosphate of iron,	14	do
Lime,	79	do
Magnesia,	38¼	do
Potash,	49¼	do
Soda,	68½	do
Chlorine,	3½	do
Sulphuric acid,	17½	do

If in the red variety we add together the inorganic matter of the 7½ tons of tubers. and the 5.62 tons of tops, we have 636 lbs. of inorganic matter. These 636 lbs. we will suppose to be the amount of inorganic matter taken up yearly by the artichoke plants from an acre of soil. It contains the following bodies in the following proportions:

Carbonic acid,	47½	pounds.
Silicic acid,	118	do
Phosphoric acid,	73	do
Phosphate of iron,	17	do
Lime,	86	do
Magnesia,	39¼	do
Potash,	138¼	do
Soda,	82	do
Chlorine,	8½	do
Sulphuric acid,	26½	do

If the tops and tubers are both removed from the soil, then from each

Digitized by Google

acre there will be taken the aforesaid 636 lbs. of inorganic matter, the composition of which is seen above. This 636 lbs. could be returned to the soil, by adding for the 118 lbs. of silicic acid, four tons of hog or cow manure, or 1,000 lbs. of ashes; the 73 lbs. of phosphoric acid and the 17 lbs. of phosphate of iron, by adding 3½ tons of hog manure, or 11½ tons of cow manure, or 460 lbs. of ashes, or 300 lbs. of bone dust; the 86 lbs of lime, by 43 tons of hog manure, or 86 tons of cow manure, or 300 lbs. of ashes, or 86 lbs. of caustic lime, or 220 lbs. of plaster; the 39½ lbs. of magnesia, by adding 40 tons of hog manure, or cow manure, or 1,000 lbs. of ashes; the 138 lbs. of potash, by 45 tons of hog or cow manure, or 1,700 lbs. of ashes; the 82 lbs. of soda, by 10 tons of hog manure, or 7 tons of cow manure, or 600 lbs. of ashes, or 165 lbs. of common salt; the 26½ lbs. of sulphuric acid, by 8½ tons of hog manure, or 6½ tons of cow manure, or 900 lbs. of ashes, or about 48 lbs. of plaster. If the tops are left on the ground, and the 7½ tons of tubers only removed, they would take away only 203 lbs. of inorganic matter, which could be replaced as follows: the 3 lbs. of silicic acid, by 200 lbs. of hog and cow manure, or 25 lbs. of ashes; the 25 lbs. of phosphoric acid, and 3 lbs. of phosphate of iron, by 1½ tons of hog manure, or 3½ tons of cow manure, or 200 lbs. of ashes, or 100 lbs. of bone dust; the 7 lbs. of lime, by 3½ tons of hog manure, or 7 tons of cow manure, or about 22 lbs. of ashes, or 15 lbs. of plaster, or 7 lbs. of caustic lime; the 1 lb. of magnesia, by 1 ton of hog or cow manure, or 25 lbs. of ashes; the 89 lbs. of potash, by 60 tons of hog or cow manure, or 1,000 lbs. of ashes; the 13½ lbs of soda, by about 1¾ tons of hog manure, or 1¼ tons of cow manure, or 100 lbs. of ashes, or 25 lbs. of common salt; the 9 lbs. of sulphuric acid, by 3 tons of hog manure, or 2½ tons of cow manure, or 300 lbs. of ashes, or 18 lbs. of plaster. By looking over the preceding calculations, the bad policy of adding only one kind of manure to return the bodies removed by this crop, (the same is true of other plants) will be strikingly exhibited; for instance, in the calculations for returning to the soil the inorganic matter removed by the tops and tubers, it will be seen, that by adding to the soil 4 tons of hog manure, the 118 lbs. of silicic acid removed by the crop is restored; but it requires to return the phosphoric acid only 3½ tons of hog manure, while for the lime it requires 43 tons, for the magnesia 40 tons, for the potash 45 tons, for the soda 10 tons, and for the sulphuric acid 8½ tons.

Again, to restore the inorganic matter removed by the 7½ tons of tubers, it requires for the silicic acid only 200 lbs. of hog manure, while for the phosphoric acid it requires 1½ tons of hog manure; for the lime, 3½ tons;

Digitized by Google

for the magnesia, one ton; for the potash, 36 tons; for the soda, 1¾ tons; and for the sulphuric acid, three tons.

Now it will be plainly seen from the above, that if you add only hog manure to restore the loss, there will be a great waste of material. If you add 3½ tons of hog manure, it will restore the phosphoric acid taken away, but it will not be sufficient to restore either the silicic acid, the sulphuric acid, the soda, the magnesia, or the lime. If we add ten tons, it will furnish the amount of soda, but not enough lime, magnesia, or potash; yet more than is necessary of phosphoric, silicic, and sulphuric acids. If we add 45 tons of hog manure, it will be enough to restore the potash removed, but more than is necessary of all the other inorganic bodies. While the 45 tons furnish but barely enough potash for a single crop, it supplies silicic and phosphoric acids enough for eleven crops, sulphuric acid enough for five crops, soda enough for four and a half crops, &c. If the tubers only are removed from the soil, the waste will be much greater. For instance, it requires only 200 lbs. of hog manure to restore the silicic acid removed by 7½ tons of tubers, 1½ tons to restore the phosphoric acid, while it requires 36 tons to restore the potash.

By what means can this great waste of material be saved? Every practical man would tell us that it could be done by a proper mixture (which is to be modified by the crop) of certain mineral bodies with organic manures, forming what is commonly called compost. A compost adapted to the wants of the artichoke would not, as will be seen by referring to the prefatory remarks, be a proper one for corn or wheat, because they differ materially in the inorganic constituents. Hence each variety of plant should have its own peculiar compost, so prepared as to furnish it with the constituents in the proportion most naturally adapted to it. For instance, the following compost, in the quantities given below, would be an economical and very good manure for the artichoke, and would be equivalent to what is removed in 7½ tons of tubers. Besides the inorganic matter it supplies, it furnishes the soil with considerable organic matter to increase its absorbing power, elevate its temperature, and aid in the solubility of the inorganic constituents, aside from acting as food itself for the plant.

Compost—Fifty pounds of gypsum, or plaster; fifty pounds of common salt; three hundred pounds of ashes; one ton of hog manure, or two tons of cow, sheep, or horse manure; five to ten tons of peat.

The aforesaid calculation supposes the soil to be in a good condition when cultivation begins, both mechanically and chemically. What is added is merely to supply the waste, or return the materials removed by the crop, and thus preserve the soil at least in as good a condition as before cultiva-

Digitized by Google

tion. If a soil were poor and barren, and the object was to reclaim it, or render it rich and productive, the first step is to determine its mechanical condition and chemical composition. The second step, to alter its mechanical condition, if necessary, by draining, irrigating, adding peat, sand, or clay, as the circumstances of the case may require, and such a compost of manures as will bring its mechanical condition and chemical composition to such a state as will make it correspond with that of a rich, productive soil.

We now come to the nutritive powers of the artichoke tubers:

	WHITE VARIETY.			RED VARIETY.		
	500 grs of fresh tubers.	100 grs. of fresh tubers.	100 grs. of dry tubers.	500 grs. of fresh tubers.	100 grs. of fresh tubers.	100 grs. of dry tubers.
Water,	418·04	83·608	.....	341·75	68·330	.....
Fiber,	11·26	2·232	13·964	18·38	3·676	11·672
Sugar and extract,	19·76	3·952	24·509	38·44	7·688	24·407
Dextrine	13·26	2·652	16·445	27·18	5·436	17·260
Casein,	10·26	2·052	12·725	22·00	4·400	13·976
Albumen,	16·40	2·080	12·899	20·43	4·086	12·974
Starch,	14·25	2·850	17·673	29·42	5·884	18·682
Resin,	·84	·168	1·041	·92	·184	·584
Glutinous matter,	·48	·096	·595	·61	·122	·387
Fat,	·12	·024	·149	·09	·018	·057
	498·67	99·734	100·000	499·22	99·844	100·000

For comparison we introduce the following, which is the composition of the fresh tubers of the potato in a hundred parts:

	One hundred parts of fresh potato tuber.
Water,	74·712
Fiber,	6·839
Sugar and extract,	2.367
Dextrine,	0·923
Casein,	2·054
Albumen,	0·185
Starch,	12·399
Resin,	trace.
Glutinous matter,	0·009
Fat,	0·008
	99·496

The artichoke contains much less starch than the potato, but is richer in sugar, dextrine, albumen and casein. Its power for fattening, perhaps, would not equal that of the potato, but in muscle, nerve, &c., forming products, or nitrogen bodies, its composition would place it quite equal to that of the potato. The analysis show it to be even richer. We hope, as the plant is

Digitized by Google

one of easy culture, that its utility as food for stock will be practically tested.

Ultimate organic analysis of the dry tubers,

	White variety.	Red variety.
Carbon,	45·817	45·918
Oxygen,	40·926	40·566
Hydrogen,	5·768	4·829
Nitrogen,	3·378	3·597
Ash,	4·728	4·270

One ton of the tubers of the

	White variety	Red variety.
Contain, Water,	1672·16	1366·68
Fiber,	44·64	73·52
Sugar and extract,	99·64	153·76
Dextrine,	53·04	108·72
Casein,	41·04	88·00
Albumen,	41·60	81·72
Starch,	70.04	117·68
Resin,	3·36	3·68
Glutinous matter,	1·92	2·44
Fat,	0·48	0·36

From the foregoing results we observe that the white tubers contain more water than the red. The former has 83·608 per cent., while the latter has 68.83 per cent The mean per cent. of water in the two varieties is 75.969 which is not far from the mean per cent of the potato. Generally, however, we should judge them to be more watery.

Analysis of the Parsnip, (*Pastinaca sativa.*)

BY J. H. SALISBURY, M. D.

In this country the parsnip has not to any great extent been raised for feeding stock. In England, however, they have been grown somewhat for this purpose, and have been found to be, as their composition would indicate, highly valuable.

* "The average yield per acre is about from nine to eleven tons. In the eastern district of Jersey, however, the prize crop for 1839, gave the enormous yield of 27 tons 8 cwt., per acre.

"In October the leaves as they begin to decay, should be cut off, and given, when dry, to the cows: it is important to see that they are dry, as when moist from rain or dew they are apt to inflame the udder. The leaves

* J. Le Couteur, on the culture of the parsnip; Journal of the Royal Agricultural Society of England, 1840, Part 4th.

Digitized by Google

come in as a convenient auxiliary to grass at this period, and if given moderately, a good armful per day, to each cow, will impart nearly as much richness to the milk as the parsnip itself.

"This most excellent root will fatten oxen or pigs (or poultry if boiled) in an extraordinary manner, and is certainly one of the best preparatory crops for wheat."

The plants analysed were very large roots, fleshy and finely flavored. They were furnished by Mr. Douw, of Greenbush. The average length of the roots twelve inches, average widest diameter three inches, average length of tops twenty-eight inches, average weight of each root nineteen ounces.

Percentage of water, dry matter and ash.

	One hundred parts of fresh root.	One hundred parts of fresh top.
Percentage of water.....	81·312	89·125
do dry matter,.....	18·688	10·875
do ash,.....	1·280	1·760
do ash in dry matter,...	6·850	16·184

The parsnip root contains a larger percentage of water than the potato, and a smaller percentage than the turnip, carrot and beet. About 18½ lbs. in the hundred is dry matter, the rest is water. The tops contain about 11 per cent. of dry matter; 7813 lbs. of the fresh roots contain 100 lbs. of inorganic matter or ash; 5682 lbs. of the fresh tops yield 100 lbs. of ash.

	One hundred lbs. of the ash of roots.	One hundred lbs. of the ash of tops.
Carbonic acid,.....	21·85 lbs.	23·51
Silicic acid,.....	0·45 do	0·92
Phosphoric acid,.....	15·10 do	4·31
Phosphate of iron,.....	0.65 do	1·43
Lime, ...	3·35 do	1·32
Magnesia, ...	1·60 do	0.51
Potash,.....	8·45 do	5·33
Soda,.....	38·20 do	54·32
Chlorine.....	0·60 do	3·13
Sulphuric acid, ...	8·95 do	3·92
	99·20 do	98·80

The 100 lbs. of inorganic matter removed by 7813 lbs. of roots could be returned to the soil by adding to it 100 lbs. of ashes, 40 lbs. of common salt and 15 lbs. of plaster. The 100 lbs. of inorganic matter removed by

Digitized by Google

5,682 lbs. of tops could be returned by 60 lbs. of ashes, 90 lbs. common salt and 10 lbs. of plaster. The necessary organic matter could be furnished by from three to five tons of cow or horse manure. As a general rule a ton of common barn-yard manure, or its equivalent should be added to the soil for every ton of roots removed. This furnishes sufficient organic matter to supply the demands of the plant, and to keep the soil warm, loose, soluble and retentive. Besides this, it supplies a sufficient amount of most of the inorganic bodies, necessary for the plant, except phosphoric acid, potash and soda. The deficiency in these can be made up with ashes, plaster and common salt.

Proximate Organic Composition.

	One hundred parts of fresh root.	One hundred parts of dry root.
Water,	81·312	
Fiber,	5·325	28·118
Sugar and extract,	8·800	46·603
Dextrine,	2·165	11·300
Casein,	0·150	0·793
Albumen,	0·925	4·884
Starch,	1·395	7·365
Resin,	0·095	0·501
Gluten,	0·040	0·211
Yellow coloring matter,	0·020	0·106
Fat,	0·023	0·116
	100·250	100·000

Besides the above bodies, the root contains a small quantity of malic acid, and a principle which gives the peculiar odor to the parsnip.

Ultimate Organic Analysis.

Nitrogen,	0·943
Carbon,	42·222
Oxygen,	44·407
Hydrogen,	6·850

The parsnip contains a larger percentage of starch and dextrine than the beet, carrot or turnip; but less sugar and albuminous matter. The percentage of nitrogen in the dry root is a little less than one per cent., which shows it to be less rich in this body than the beet or carrot.

Digitized by Google

MR. DELAFIELD'S SURVEY OF SENECA COUNTY.

Every step taken by the New-York State Agricultural Society indicates progress. At no time, and under no circumstances, as far as we are informed, has an association formed for purposes so beneficent and so useful, in so short a time, not only enlisted the confidence of the farming public, but so richly deserved it. Commencing its operations in 1832, and struggling in its embryo state through difficulties and embarrassments that would have wrecked less persevering men, it has, by its tact and adjustment to the wants of a community like ours, slowly but steadily advanced to be now its favorite institution. And how could it have been otherwise, for its success, as all felt, was to be the signal for the prosperity of the State. It is fortunate that its interests were confided to men who appreciated the true condition of Agriculture at its formation, and who have had the talent, industry and perseverance that have promoted its advancement. To form some opinion of its improvement under the fostering care of the Society, compare the rude and imperfect farm implements of 1830, to the model ones of 1850. From the first, you infer how the work was done in their time with them. From the latter, how the work can and will be done now. And likewise compare the products from the worn out land at that time to those of the same land now, where it has been under the direction of an intelligent agriculturist.

This last remark is strikingly exemplified in the survey of the county of Seneca, by Mr. Delafield, where the historical information upon this point has been most satisfactorily collected. For instance, in 1840, from ten to fourteen bushels of wheat were, upon the average, raised on the acre in that county, and so proportionately of the other grains. In 1850, the average of wheat per acre was twenty bushels, and not considered as at all unusual, and so proportionately are the other grains increased. In our immediate vicinities, which are peculiarly favorable to make correct observations upon the farming products of surrounding localities for the last twenty years, this fact of increased production is incontestibly settled. It has for some time past often been a source of remark, not only by ourselves, but by the most intelligent men, that apparently of many kinds of grain, such as oats and buckwheat, and occasionally rye, nearly as much is now sown as was formerly raised, and of potatoes and corn, two of our most profitable crops the quantity raised is at least doubled. It is true more land is put to their culture, but it is likewise true the product per acre, on the average, is very much augmented. To what cause but this, can we impute the increased price of land per acre, from twenty up in many instances to one hundred

Digitized by Google

dollars, for entire farms of one to two hundred acres. Can we impute it to increased population, creating a greater demand for its products? No; for look at the census of 1850, and you will observe that in the older counties in the State, remote from cities, in the last ten years, the population remains nearly stationary. It was the imperfect method of farming, and its scanty returns from an impoverished soil, that created a necessity for an organized and systematic effort on the part of the farming community, to promote that interest. The effort was made. A State Society, to foster Agriculture and the kindred arts, together with collateral aids in the formation of similar societies in almost every county in this State, is the fruit of it. Indeed a short review of its general operations may here not be out of place; but we will not go back to describe the dim twilight that preceded its birth, but trace a few steps that have accompanied its onward progress.

It had its due share of influence in bringing about the Geological Survey of the State, the knowledge of which was as important to us at the commencement of our investigations, as is that of the anatomy of the human body to the young physician and surgeon, and so too have been the developments of its treasures as applications to aid in our husbandry, as is the knowledge of the effect of the many appliances used by the faculty for the cure of the diseases of the body. It is not our business to speak of it here as a work in its present shape the most useful and commodious, but it certainly will be the entering wedge through which the resources of our great State will become more generally known, and for the future be better appreciated. It has given confidence to our Legislature, in their willingness to contribute for the benefit of their constituents, towards their funds, and thus aid the Society in giving rewards for successful industry. It imparted that same glow of confidence to a discerning public, and brought into existence the many county agricultural societies that are now nearly co-extensive with its borders. It has created that individual competition at our State Fairs, in the exhibition of the most profitable and valuable animals, the best of farm implements, of the mechanic and manufacturing arts, of articles of almost every description, that have already been shown, to the delight of the hundreds of thousands that have attended them. It has carried that same spirit of local improvement down to the county fairs, which in many instances, will now almost vie in their exhibitions with that of the great Annual State Fairs, of which they were intended to be, as far as practicable, the copies. It has started into existence the many agricultural papers that are now issued by thousands from the presses instituted for that purpose, and as an evidence of our onward progress, those papers from having been a collection of the wise sayings of our grandfathers upon the rules

Digitized by Google

of rural husbandry, as taken from the almanac, now contain essays and dissertations upon the general and isolated subjects of our art, that would do credit to our most learned and accomplished professors. Our yearly Transactions too, our Legislature have caused to be published, and by their dissemination, and that of our papers, it has diffused a spirit of inquiry at home always attendant upon, and the sure accompaniment of progress. It has scattered that spirit abroad, as we see our sister states of Delaware, Maryland, Ohio, Michigan, Georgia, Pennsylvania, New Hampshire, and possibly others, following our noble example. The citizens of the last state frankly acknowledged the fact that they were following the example set them by the New-York State Agricultural Society; that she intended to take our organization for a model, and invited several of our members to witness their first exhibition.

The excellence and variety of our fairs, too, has been the theme of many a tongue, the subject of many a newspaper paragraph; and its order of business, from the most important to the most trivial, is as promptly and eagerly published in all the newspapers of the land, as the most important event of the times. It is not giving it undue credit to ascribe at least a portion of the influence that has produced the World's Fair at London, the present year, to the great and successful example our Society has given, not to America alone, but likewise to Europe. And, not stopping at outward show as the evidences only of its progress, it has caused a critical, useful, and most commendatory survey of all that appertains to the earth's formation, the knowledge of which can be made subservient to our agriculture, to be commenced under its auspices, and in two of the counties, viz: Washington and Seneca, to be finished; and, in both cases, they are creditable alike to the Society that instituted and to the gentlemen who conducted them. These surveys will unquestionably be extended, under the same auspices, to the different counties in the State, and will contain a compendium, produced much cheaper, more practical, and far more useful than the more elaborate and ornate work of the State Geologist.

These are a few of the results that have emanated from the existence of our State Society—but we have not been barren of more substantial fruit. It is farther manifested in our increased production of all that constitutes a nation's prosperity; and the coming census, if it does not in all the counties in the State show that in the last few years we have produced more than formerly, it will at least satisfy the most incredulous, that in those counties where the spirit of improvement has been most rife, the increased productions of the soil are most apparent.

These remarks are preliminary to the report of the committee who were

Digitized by Google

appointed by the executive officers of the Society upon Mr. Delafield's survey of the county of Seneca. The manuscript having been submitted to them, they have given it that careful perusal to which it is certainly entitled. It is an elaborate historical, geographical, geological and agricultural survey of the county—its chapters treating, in their subdivisions, on the different subjects that necessarily grow out of the branches of these important general heads. Under the first head, the general history and settlement of the State of New-York is given: The extension of the settlements to the county of Seneca: The history of the native race it found there: Their connection with the other tribes of Indians, under the general terms of the Iroquois nation: The wars of the early settlers with them, and their ultimate expulsion from that part of our State, after their signal defeat by General Sullivan: The progress, subsequently, of the settlers: Their alternate success and suffering, until the whole county was finally occupied.

The historical part relates many interesting incidents that occasionally occurred during these unsettled times and border troubles, and brings to light many new facts to the reader, that without these reminiscences would have soon passed into oblivion. While the collection of the incidents related gives interest to the work, yet in our minds it is questionable whether, for a historical survey of the not large county of Seneca, it is desirable to enter into the particulars of a general history of the State, remote from the county of which the sketch is to be given, but only so far as it has a direct and immediate influence on the locality of the county selected. It is true, the early settlement of the State led slowly on to the settlement of the county of Seneca; but, if we go back to all these contingent and remote events, in distant parts, although it may be in the same State, it gives an unnecessary fulness to a narrative, when treating of an area of only a few miles square, and which would be better adapted to the more extended history of the State. We have yet more than fifty counties to be surveyed. If, in the survey of the historical part, we are to have in each the same elaborateness, it gives too much volume to what needs no repetition, and is best disposed of by confining their survey as much as possible to the events that have transpired in their immediate borders. For ourselves, however, we do not complain of the course taken by the surveyor. We only speak of it as rendering such a work too voluminous. In all probability, we are to have many more of these surveys, of other counties in the State, when, with the same appropriateness, this example may be followed by others who are not so competent to give them.

In no part of this survey, however, were we more interested than in the historical record of the events that gave rise to and attended the expedition

Digitized by Google

of General Sullivan, in 1799, to chastise the hostile Indians in the western portion of our State, and the narrative describing that campaign has a clearness and fullness not only very desirable, but necessary to a full understanding of it. In these particulars, it is the most satisfactory account of that expedition we have ever seen any where, and we give its author due credit for the care and pains with which he has gathered his materials, and the satisfactory manner in which he has disposed of them, That portion in which he gives us a view of the State of agriculture among the Indians, and the articles they cultivated at that time, is exceedingly interesting, and if specimens of their various productions, as far as practicable, could now be procured and compared with those grown by the white man, it would be the cause of some reflection. We think we did not misunderstand the author where he says: "some portions of their orchards are still in existence, yet bearing their products." Could the Society have a sample, at one of our exhibitions, of an Indian apple, grown on a tree probably planted before the ground was trod by the foot of the white man, it would so far be demonstrative proof that our natives were not unapprized of the advantages leading to modern civilization.

Its next division is into political and physical geography. Under these heads the proper subjects are arranged and treated in a most satisfactory manner. All that can be said, or ought to be said, is done after the most careful examination; indeed, great pains and unwearied industry must have been used to gather the facts that throw light on these subjects. But it is in its geological department where, apparently, the most pains have been taken to give a full and perfect sketch of the natural structure of the county. If there is a defect in the want of information imparted to the reader, by the bad arrangement of the different subjects treated of in the Geology of the State, it is that in surveying localities they did not give all the information necessary to a correct understanding of the town or county upon which such information was sought. For the different subjects occupying near the same ground, you are obliged to grope your way through several volumes and many pages before you ever can find what you seek for. But in the survey of the county of Seneca you have the different subjects entering into its formation, so clearly and comprehensively arranged and elucidated, that it cannot be misunderstood. Throwing aside its theories of the causes of drifts that have operated to make special deposits of the different subjects that enter into its peculiar formation, which are certainly plausible, but in their very nature speculative and uncertain—yet the particularity with which its geological survey has been made—the care taken to gather facts, and facts only—the industry and perseverance which such a collection would require,

Digitized by Google

and the collation of the materials thus gathered—entitle the gentlemen who have been engaged in this work to great credit for their intelligence and zeal.

Its agricultural department comes next. This, as most appropriate to the subject of this report, we will not enter into. The work which follows will best satisfy the reader that no effort has been wanting to make it full and interesting, and as its improvement is the basis upon which rests the usefulness or reputation of this Society, to give it full effect, we had better let the authors speak for themselves. We will not, however, conclude this report of the survey of Seneca county without observing that, as it is one of the fruits which have been produced by the formation of the New-York State Agricultural Society, if we progress no farther in accomplishing the objects of our organization, it will be a lasting monument of the benefits it has conferred by this investigation. It affords, too, a prospective view of what this community have to hope from its efforts in future, should those efforts be continued. We trust no reader having undertaken to look into this survey, will, on account of its length, be deterred from its entire perusal, He will find in it information varied, agreeable, and instructive; and if, in some of its reasoning and relation of events, he may find what was before in part familiar to him, yet there is a clearness and freshness in both these respects, that will leave none but the most pleasant recollections behind them.

J. P. BEEKMAN,
E. P. PRENTICE,

February, 1851. *Committee.*

Digitized by Google

A GENERAL VIEW AND AGRICULTURAL SURVEY OF THE COUNTY OF SENECA.

Taken under the direction of the New-York State Agricultural Society,
BY JOHN DELAFIELD.

[Copy right secured by the Author in the Clerk's office of the Northern District of New-York, A. D. 1851.]

"That which hath been is now; and that which is to be, hath already been."

In accordance with the wishes of the New-York State Agricultural Society, as expressed in a communication from their esteemed Secretary, B. P. Johnson, Esq.; this work was undertaken in April last, and every portion of time not required by the care and practical management of a large farm, has been devoted to a search for correct information, relative to the various objects named in the instructions of the Society.* Every town-lot in the county, surveyed under the authority of the State, has been visited and examined. The rock formation upon which the soils are based, was traced and examined by an accomplished geologist;† the limits of the various divisions, were carefully and exactly ascertained and defined; and to the same gentleman, acknowledgments are due, for the chemical examination of the rocks and soils of the county, exhibiting the nature and amount of the several mineral elements or matters contained in them; thereby leading to a knowledge of the best modes of improving and cultivating the soil.

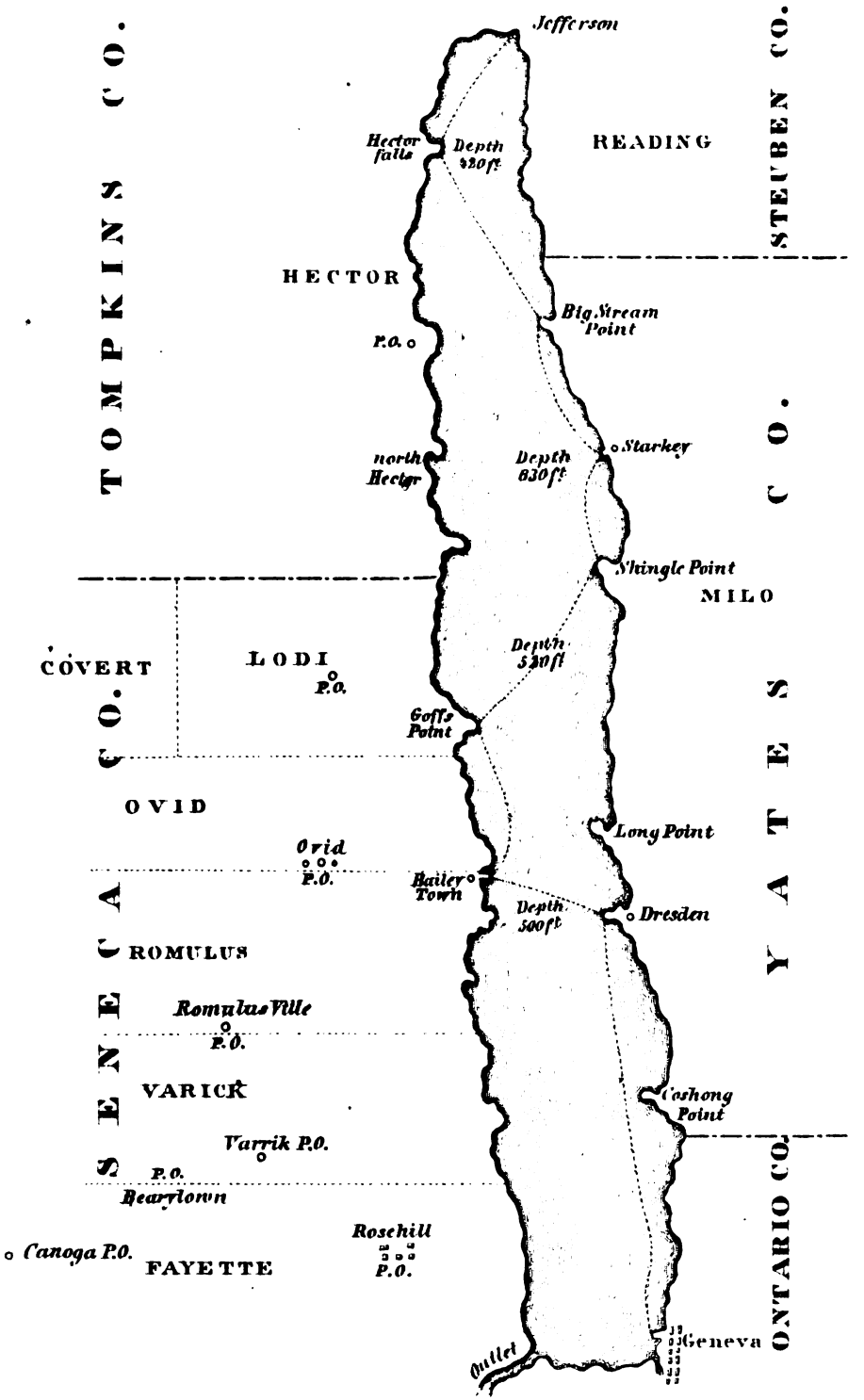
To the analysis of the soils of farms, in the various sections of the county, much importance is attributed; and at this early day benefits are confidently looked for by many, whose farms were first analysed.

The analysis of farms in each town, also offers a foundation for comparison at some future period, by which an improved or deteriorated condition of the soil may be ascertained. With this view, a specimen of the soil of each farm subjected to analysis, has been preserved in glass jars, sealed, and the locality labelled distinctly thereon: these specimens are deposited in the museum of the State Society, and duplicates are subject to the order of the County Society.

In the agricultural division of this work, every avenue has been carefully sought and examined for the assurance of accuracy: abundant facilities have been afforded for frequent comparison of views and facts; they were frankly and freely tendered by

* See Transactions, vol. 7, page 36. † Dr. Thomas Antisell.

Digitized by Google



Digitized by Google

Digitized by Google

Digitized by Google

Digitized by Google

the farmers, and a kind feeling was uniformly manifested to aid in the production of correct and digested material.

As no correct map of the county exists in any of the State or county offices, it became necessary to procure from the Surveyor-General the field notes of the survey ordered by the Legislature for the division of this county as part of the military tract. With these notes and the aid of a careful and correct surveyor,* a map has been constructed, on which the hills and valleys are delineated, the elevation of prominent points is noted and every road is carefully laid down.

Notwithstanding the existence of the college at Geneva, no observations appear to have been recorded, by which to establish its true latitude and longitude; the nearest points hitherto supposed to be known or determined are, Canandaigua and Auburn, as reported by the Regents of the University to the Legislature, and from these points near the western and eastern boundaries of the county, its geographical limits are computed, and do not vary probably very far from the truth.†

The historical sketch, serves to show the advance of civilization from the shores of the Atlantic ocean, until it penetrated into the thick forests of the lake country, it accounts for the decline of the red men, and traces the foot steps of the white men to their possession and settlement of the county.

The drawings of grasses, fossil remains and other illustrations are from the pencil of a farmer's daughter of the county.

To Judge Tremper of Dresden, and to General Joseph G. Swift, of Geneva, many thanks are due for valuable meteorological and general information; and likewise to the several Vice Presidents and other officers and members of the county Agricultural Society, for useful information and facilities afforded while visiting their respective towns; to my brother farmers also, for their kindness and hospitality.

The survey is now submitted, not as a perfect work, yet as containing facts hitherto unknown to farmers generally; and information of a character and importance, which may greatly improve even the best cultivated farms, by the adoption and use of one or more of the methods indicated.

No pretension is made to offer any new principles, for there are none; the effort is, to make known facts and circumstances which have existed, though unknown or unused, for a long series of ages; which when understood and applied must conduce to the comfort, happiness and welfare of all; to portray correctly the past and present condition of the county, that the necessity as well as the means for improvement may be better considered and understood.

T. DELAFIELD.

December, 1850.

* Wm. T. Gibson, Esq., of Waterloo, Seneca county.

† Measures are now in progress for a series of correct observations.

Digitized by Google

HISTORICAL.

CHAPTER I.

THE history of Agriculture, as connected with the county of Seneca, has relation to a period too recent, to present, or admit of, an instructive contrast with the Agriculture of older counties in this State, or other portions of the United States.

The advance of civilization since the year 1609, when the foot of the white man made its first imprint upon the soil of this State, has been so rapid, with influences so powerful, and at this time contributing benefits so extensive to older nations of the world, that a condensed view of facts connected with the introduction of moral and social relations, and their progress or development in North America, will aid in understanding the present, and promoting the future condition of this county.

The extinction of the race of red men, the early proprietors of the soil, with its proximate cause, has a bearing of interest upon the agricultural history of the land, nor can it be forgotten that, within the age of many now living, the smoke of the council fires has risen in graceful wreaths, and fervent adoration has been addressed to the Great Spirit, by the warlike Brave, or the eloquent Sachem of the Seneca Nation.

The existing monuments of Indian agriculture indicate a condition of life above the rude and savage state, a state which contending nations have endeavored to darken by fictions in their history, and presenting a field of inquiry appropriate to this survey.

An eager and ardent appetite for mercantile ascendancy, deeply engaged the speculative minds of commercial men in Europe, about the end of the sixteenth, and beginning of the seventeenth centuries. The bold and daring enterprises of Captain John Smith, in Turkey, from whence he returned to England in 1604, and his expedition with Gosnold to Virginia, and the adventures of Champlain in Canada, effectually stimulated and roused the Dutch nation to appease their appetite for wealth, by reaching the treasures of India, through a route at once short, and free from the terrific tempests of the southern ocean, or the not less dreaded dangers of the Asiatic seas.

It was fortunate for the Dutch that the jealousies and contentions of the British merchants, allowed Hendrick Hudson to retire from their service, after two unsuccessful voyages, in 1606. The Dutch East India Company availed themselves of his experience, induced him to enter their service, and under their auspices, to explore the northern seas for the desired short route to India.

Digitized by Google

In the month of April, 1609, Hudson sailed from Holland in the "CRESCENT," or Half-Moon. Coasting along the inhospitable ice-bound shores of Greenland, and the high, bold coast of Newfoundland, he touched at Cape Cod, and thence steered for the British Colony established in Virginia: changing his course. he then followed the shores of the American continent until the third day of September, when he entered the mouth of the noble river which bears his name.

Hudson ascended the river as far as Albany, indulging a hope of communication with a northern sea or ocean; the shallow waters above Albany destroyed this hope, compelling him to return to the Atlantic. There is an account of the country along the banks of the Hudson, published in Amsterdam, in 1656. The work was compiled by Vanderdonck, one of the first residents on the island now called New-York. Many curious facts are stated, but as most interesting to the present work, he relates that the country was for many miles covered with grape vines, yielding much fruit; so abundant, that at an early date of the colony, wine was made, and became an article of export to Holland. Other productions are named by him, but in some instances they must have been introduced from Europe, such as apricots and melons. Indian corn and beans were presented as food to the first Europeans who touched the shores.

The red men, who were the lords of the soil at the time of the discovery, were known by the general appellation of Iroquois, a nation, or a confederacy, whose power extended from the Atlantic to the Ohio river, and from the St. Lawrence to the Potomac—a people of indomitable energy, and possessing an imperishable love of liberty. This confederacy was composed of six distinct nations, the most powerful member being the SENECAS, or SENEKES, inhabiting the region south of Lake Ontario, and extending from the western shores of Cayuga lake, into the dense forests of the far west, where war-paths conducted them to the hunting grounds of the Hurons and Eries, which tribes they drove beyond the lakes. The Cayugas, Onondagas, Oneidas, and Mohawks, completed the original confederacy, to which at a later period, the nation of Tuskaroras was added, making in all six nations, a power at whose name all other native tribes and nations trembled.

Our national records afford abundant proof of the energy, courage, and force of character, of the people who occupied western New-York from 1670 to 1840. Their prowess in war is well developed as a national characteristic, in the achievements of Hendric, Brant, Cornplanter, and other war braves; their eloquence, in the speeches of Logan, Red Jacket, and other sachems.

When Hudson entered the harbor of New-York, then called Manhattan

Digitized by Google

by the natives, a Frenchman, bold and daring, joined a war party of Indians from Canada, and penetrated the country of the Iroquois, near to the upper waters of the Hudson. It was Champlain, the founder of Quebec, who thus as a European, trod for the first time, the soil of Northern New-York. Elated with the knowledge procured during his hazardous expedition, Champlain returned to France, kindling in the breasts of his countrymen ambitious views and high hopes.

In 1615, Champlain again entered the Iroquois country from Canada, as a foe, but, wounded and repulsed, he found safety only on the Canadian banks of the St. Lawrence; while the sachems and warriors of the Mohawk, with their allied nations, rejoiced in successfully protecting their homes and hunting grounds from the grasp of strangers and intruders. The more sagacious policy of the Dutch, gave them a friendly footing on Manhattan island in 1609. The Dutch merchants were more intent upon traffic and trade with the natives, than the establishment of colonies. Assiduous in their endeavors, they promoted kindly feelings, and avoided, as far as practicable, all means of offence or ill will. A few hovels, therefore, were erected for temporary shelter, during the periods of traffic, until 1614, when a fort was erected, indicating a more sure possession of their discoveries.

In 1615, Albany began to assume the character of a trading post, and with the increase of inhabitants on Manhattan island, an increase of means of protection became indispensable. A block house was erected in 1623, and from this period may be dated the determined establishment of a Dutch colony. Though fourteen years had elapsed since Hudson landed at New-York, without the erection of permanent edifices for the settled abode of Europeans, yet their intercourse with the natives exhibited to, and early instructed them in the use of fire-arms—to them the most wonderful weapon of attack and defence, and simultaneously the introduction of ardent liquors, made them acquainted with an insidious foe, far more destructive than the musket. All the vices of the white man followed in succession.

If by the term civilization, is meant that development of the human powers which shall produce the greatest amount of human happiness, it will be doubted by many whether the standard of civilization was elevated or depressed among the Indians, by their contact with Europeans, in the beginning of the seventeenth century.

The marked development of intellect in Europe and the United States, within the last century, points to a highly elevated standard, very far above the measure indicated at the period of the discovery. The advance of the natural sciences, the progress of art, and consequent refinement, have been diffused among most nations, but events and causes operating favorably upon

Digitized by Google

European civilisation, have but recently shed a healthy influence upon the natives of America. Wars of extermination, schemes of territorial aggrandisement, have, until within a few years, demanded every energy of the Indian nations to resist, if not exclude, the white man foe.

When Hudson stood upon the island shore, surrounded by swarthy, sinewy men, the only weapon of offence among the warriors was the war-club, the arrow with head of flint, or hatchet rudely made from stone. Yet a short time had passed away, when the same men were seen brandishing the knife or dagger with glittering blade, the tomahawk with keen steel edge, and rifle of deadly aim. But Hudson did not live to witness the results of his discoveries, fraught with distress and evil to the native—his fate was early sealed, deserving a passing notice.

His daring enterprize, in 1607, is without a parallel, claiming admiration at the hardy resolution of that bold navigator, who, in a small vessel, with a crew of ten men and a boy, sailed from London, intending to reach China by a northwest passage. After touching the high latitude of 80°, returning in the month of September, unsuccessful, but not disheartened— during a second voyage, landing at Nova Zembla, and returning again disappointed, but nothing daunted, he entered upon his third voyage, during which he discovered and ascended the Hudson river, as has been stated.

Elated with success, excited by dreams of wealth and power for the future, and aided by the commercial spirit of English merchants, Hudson was readily refitted for his fourth voyage. He sailed on the 17th of April, 1610, passed Greenland on the 4th of June, and reached the strait which now bears his name, in latitude 60°, entering the great bay which is also called by his name, and too late in the season to brave the winter storms of the Atlantic, he determined to winter in the bay. The vessel was drawn into a creek, and every means used to ward off, or mitigate the severities of a winter in that desolate region. Privation and disease pressed heavily on the spirits of the officers and crew. Their stores fast diminishing, without any means of supply, Hudson prepared his vessel for sea, at the opening of spring; leaving the scene of his hardships, he put to sea. For two days they were driven to and fro, by fields of ice, when, in bitterness of soul, he called his men around him, painted to them their true situation, the necessity for implicit obedience, and rigid economy in the use of their small store of food, and he divided the last bread equally among them, as tears rolled down his bronzed and sea-worn features. When he reached the western end of the straits, murmurs of discontent broke forth from the crew. In a moment of anger, he threatened to set the ringleaders on shore. Irritated and exasperated, the crew entered his cabin at night, tied his arms

Digitized by Google

behind him, and, placing him in the ship's boat, with his son and seven of the sick and most infirm men, turned him adrift. They were never heard of, and doubtless perished on the rocky shores of the bay, or were engulfed in its icy waters.

Afraid to think of treachery so base, stung by conscience, and too late aware of having forfeited all confidence in Him who alone can save, the wretched remnant of the crew were terrified by every wave. Death, attended by storm and tempest, by famine and despair, seemed to hover over the frail bark, and strip these guilty men of all memory, save only of their late dark and dreadful deed. Drifting over the swelling waves, a ruling Providence permitted them to land, in extreme wretchedness, on the English coast, in the month of September, 1611, to meet that ignominy which awaits the evil doer and miscreant.

CHAPTER II.

Among leading influences contributing to the introduction and advancement of civilization, are events connected with the stormy period between 1603 and 1620. When James the first ascended the British throne, religious feuds were most bitter, and seriously affected the political relations of the realm; the individuals who refused assent to the service and ceremonials of the English church, or who absented themselves for one month from the church, had been treated as obstinate, wrong-headed non-conformists, and were threatened with expatriation, or execution.

Hope had been indulged that under the government of that monarch, the puritans would find some relief or alleviation from suffering, for it was remembered, that while yet in Scotland, he had not scrupled to declare his affection for puritan doctrines. Vain and deceitful, unmanly and pedantic, no reliance could be placed on his promises or professions, and in 1604, he openly declared that he would make the puritans conform, "harry them out of the land or elswhere,"—"only hang them—that's all." The reformers of the church, were immediately subjected to persecution, they were sorely oppressed, often made inmates of prisons, and so grevious had become their distress, that no relief could be devised or safety ensured, unless by expatriation. In 1607, the first attempt was made to reach Holland as a place of refuge; and again in 1608, Robinson, Brewster and others escaped from England under circumstances of sorrow and deep distress. For eleven years they enjoyed comparative peace at Leyden, and from that place the fame of Robinson as a preacher, and of his associates, as men of zealous piety and

Digitized by Google

truth added many to their numbers, inspired respect and obtained a widely extended public favor.

The voyages of Smith to Virginia, and of Hudson to New Amsterdam, were productive of general excitement in Europe in the seventeenth century, as intense and dazzling, as the wildest visions indulged by the El Dorado of Raleigh, or by the gold hunters of California in the nineteenth century. Men engaged in commerce and trade saw in the dim distance, honors and wealth; kings and princes indulged in dreams of territory and power. The puritans, unused to the language and manners of the Dutch, turned their thoughts to the new world as a region yet free from dissolute vice; free from persecution, or at least happy in distance and probable neglect: a region where, as they said, they could seek God, "a right way for us, and for our little ones."

After suitable arrangements had been made, they embarked in July, 1620, on board the Mayflower and Speedwell; and on the vessels' deck with bended knee, Carver, Bradford, Winslow, Brewster, Allerton, Standish, and others, in solemn prayers with their much loved preacher Robinson, implored the mercy and aid of God in their hazardous enterprize.

Many and severe were the trials, tempests and dangers which afflicted them. On the 9th of November, the cry of land roused their drooping spirits and infused new energy into the worn and weary voyager.

Already had the chill blasts of winter placed a whitened mantle upon the rocky summits of the shore; the spray of the ocean freezing as it fell, chilled the men, and stiffened the cordage of their vessels: snow and wind impeded their exertions, while inflammatory disease added to the miseries of the bleak and barren coast. In search for a place to land, they followed the coast till the 8th of December, when the wild war whoop of the Indians, and a flight of arrows in their midst, presented a new obstacle to landing. Storms of snow and rain, roaring billows, on a coast unknown, night with impenetrable darkness, bring terrors sufficient to appal the stoutest heart; but trusting, confiding in God, the breaking of the masts, the loss of sails and rudder, and increase of the furious gale, fail to dishearten men, thus nerved, and served to add fresh energy and power equal to the emergency when in a moment of imminent peril, in the midst of rocks and breakers, the frame and timbers of the vessel trembling and groaning with every surge, the vessel was lifted by a billow across a bar, and entering a bay they found themselves sheltered from the blast under the projecting banks of the shore.

It was on Monday the 11th of December, 1620, that this first party of Pilgrims landed on Plymouth rock, and that day gave birth to a new people, who planted, nurtured and matured the seed of freedom and liberty in the

Digitized by Google

new world. From that day to the present, pure and lofty notions of character are ever associated with every name connected with that gallant band of men, their women and their children. There is a charm or spell which accompanies the contemplation of their sufferings, their heroic endurance, their increase in numbers, their treaties with the aborigines, and every event in their history; a witchery so strong as to enchain the mind, and cause a reluctant return to more formal records.

The establishment of the puritan pilgrims at Plymouth, in 1620, and the Dutch, as a colony at the mouth of the Hudson river, in 1623, became at an early day, the fruitful parents of settlements in the valley of the Connecticut. The Plymouth colony established a trading house at Windsor in 1633, and the Dutch in the same year erected a fort at Hartford. These inroads upon the territories of the natives, excited a hatred deep and strong, enmity ripened into open hostility and frequent attempts were made to destroy or exterminate the intruding foe, but the sabre of Europe, the fatal ball and foreign strategy, were too potent against the war club, the flint-headed arrow and slender lance. The vices of the white man became a far more deadly weapon against the natives, and with allurements leading to excess, the destruction proved greater than could be effected by implements of war.

The French had, at the same time, (1627,) successfully established themselves in Canada, and contended with the English and Dutch for the exclusive enjoyment of the fur trade with the Indians. Thus, from the north, the east, and south, the white men from Europe encroached upon the Indian territory, forming an imposing front, advancing with rapid strides, driving before them tribes and nations; and, extinguishing their council fires, they opened the door to the vast region now converted into fields of grain and fruits. The thirst for gain soon transformed the white man into a hunter and trapper, or a dealer in bear and beaver skins. Yet the arts of the old world were accompaniments, causing the wigwam and hovel to give way to more commodious edifices, and the wild game and fruits of the forest, to be displaced by domestic animals and nutritious seed.

The progress of civilization, in this country, gives a painful record of the injustice, suffering, and distress, which overwhelmed the Indian nations—a people at once brave, and full of energy and ability. The constant succession of quarrels, between the traders and the natives, from 1630 to 1664, were attended with cruelties and murder; and the free use of brandy was a source of bitter complaint, by the Indians, who, unable to resist the once indulged appetite, felt its destructive power. Perceiving its effect, the white man applied it more vigorously; and, while they drank the "fire-

Digitized by Google

water," they heaped imprecations on the hand which proffered it—and, while maddened by its effects, would fell with the hatchet, or pierce with an arrow, the destroyer of their peace.

These continued broils led to an assault upon the Dutch colony in 1655. At that time New Amsterdam was, as it is now, the resort of strangers and adventurers; at that time, the relics of the reformation, from the various nations of Europe, all found an asylum in the new colony. Then, as now, it was the caravanserai, where all nations met, with no permanently abiding interest, yet each and all contributing to swell the tide of transient population, concentrating wealth upon the favored spot, changing from hand to hand, as the momentary proprietor shifted his scene of action, and giving place to a more numerous, and equally energetic band of successors.

The unwise conduct of the Dutch Governor, Kieft, roused the anger of the neighboring tribes, who, in revenge for his cruelties and injustice, murdered the farmer in his field, burned his dwelling, and swept away his children to far distant forests. When quiet was in some degree restored, intercourse was resumed. The treaty, or council, exhibited the points of character in the contracting powers. Nor could the Dutch feel secure, when a Long Island sachem, rising haughtily in their midst, upbraided them, saying:—"When you first appeared upon our waters, and landed on our shores, you were without food; you were hungry, and we gave you beans and corn; we fed you with oysters and fish from our rivers; and now, for our recompense, you murder our people." With such feelings deep rooted in the mind, confidence could not be restored, and though the cruel Kieft perished miserably amid the ocean waves, the enormity of his crimes, and his injustice, could not be washed away by the briny flood: the passions of the Indians were for a time only suppressed, but not subdued.

The brave and honest Stuyvesant essayed a system of lenity and justice, which, for a few years, gave peace to the colony. But his military exploits against the Swedes, in New-Jersey, with the intent of dislodging them from territory claimed by the Dutch, weakened the garrison at New Amsterdam, and induced the surrounding tribes to attack the colony in September, 1655. For nearly seventy years, a union had existed between England and Holland; but, as England became more deeply interested in trade and commerce, her people viewed with jealousy the successful results richly flowing to the Dutch, from their industry and frugality; qualities which necessarily secured to them the most lucrative branches of commerce, by enabling them to undersell their less careful competitors in every market. Instigated by motives less just than political, and relying upon the superiority of their navy, the English sought to obtain by force what was denied

Digitized by Google

to their skill. Hence, notwithstanding the treaty of alliance, which was renewed with the Dutch in 1662, the English seized the Dutch settlement of New Amsterdam (New-York), and other colonies, and afterward, in 1665, openly declared war against them.

The Dutch possessions in this country having acknowledged the sway of Great Britain, in September, 1664, the British flag floated over the defences of Manhattan, which from thenceforth has been called New-York. The surrender of this territory gave to England a full possession of the Atlantic coast, as far south as Carolina: the tenure of the country was not, however, firmly established in New-York until 1674.

It was not long before this date, that the French obtained a footing on the southern shore of Lake Ontario, erecting a fort at Oswego. This encroachment, and the influence exerted by the Jesuit missionaries over the various tribes of Indians, induced the British government to invite a conference with the Iroquois confederacy, in the hope of detaching them from the French interest. The French, emboldened by success in traffic, and the happy influence exerted by the missionaries, erected a fort at Niagara, (Unghiawraw, as pronounced by the Indians,) in 1687. From this period, the rival powers of England and France, together with political and religious feuds in the colony of New-York, essentially disturbed the welfare of the people. The French, under Count Frontignac, in 1689, penetrated the country as far as Schenectady, destroying the town, and murdering the inhabitants. The cruelties inflicted upon the English settlers, roused them to acts of retaliation, and instigated a combined movement by New-York and Massachusetts in an attack on Canada.

The enterprise failed, and on the return of the officers and men, a series of internal factions seriously impeded the healthy growth of the colony. The French continued their efforts against the Iroquois nations, who, unassisted by the English, maintained an equal struggle. Irritated by the mode of Indian warfare, Count Frontignac allowed himself to sanction inhuman outrages and tortures upon his prisoners, outstriping in ingenuity and horror the most fiendish barbarities ever attributed to the warriors of the forest. Two Mohawk prisoners were selected to undergo French torture. One of them sacrificed his fame and honor by an ignominious suicide, perpetrated with a knife, furnished doubtless by some ill-advised friend, while his companion, eager to exhibit his contempt for death, and mastery over pain, reproached the cowardly act of his fellow-captive, demanded the privilege of chaunting his death song. He narrated how many French he had destroyed with his hatchet or knife; the scalps he had taken, and the fame he had gained by such prowess. While thus singing his exploits, fire was ap-

Digitized by Google

plied to his feet, his hands were thrust into red hot tubes; his bones were broken, the sinews were twisted with heated bars, his head was scalped, and the wound filled with sand from the heated soil. It seems incredible at this day, that man could ever put off his attributes so far, or be sunk so low in the scale of humanity, to perform such atrocities.

The peace of Ryswick in 1697, brought a cessation of hostilities, permitting the French and English nations to encourage and extend by more friendly acts, their intercourse and traffic with the sons of the forest.

CHAPTER III.

The means by which art and civilization were introduced into New-York from Europe, during the period between the discovery by Hudson, in 1609, and the end of the seventeenth century, have been indicated; and it is proper here to glance at the condition of England especially, from whence the chief influx was derived.

Science and literature were in their infancy during the reign of James the First; (1603–1625,) scholastic pursuits took precedence of and retarded knowledge. Geometry was scarcely known. Among the products of the earth known as luxuries, and then *first* introduced, were tea, coffee, and chocolate, (1660,) asparagus, artichokes, and cauliflower were then rare plants. Commerce rapidly increased with the increase of liberty. Manufactures were encouraged, and the art of dyeing woolen cloth was first brought from Holland. It was stated by Sir Josiah Child, that in 1688, there were on change "more men worth ten thousand pounds in 1688, than there were in 1650 worth one thousand; that five hundred pounds with a daughter, was in the latter period deemed a larger portion than two thousand in the former; that gentlewomen, in those early times, thought themselves well clothed in a serge gown, which a chambermaid would, in 1688, be ashamed to be seen in; and that besides the great increase of rich clothes, plate, jewels, household furniture, and coaches, were in that time, augmented a hundred fold." *Glass* was then introduced from Venice by the Duke of Buckingham, and the first *turnpike road* established; and strange as it must appear to the free American, it is only 173 *years* since the law of England for burning heretics was repealed; so thick was the cloud of bigotry and ignorance which overspread that nation in the days of the commonwealth and protectorate. Notwithstanding the storms and tempests of their revolutions, the exact sciences made much progress, and art was en-

Digitized by Google

couraged. Such was the condition of England during the first century of New-York.

It is not important to pursue a connected history of this State, further than is useful to exhibit the condition of the aboriginal occupiers of the soil, their mode of life, their gradual dispossession, and the intrusion of a white people.

It has been stated that a member or nation of the Iroquois confederacy, known as the SENECAS, inhabited the region south of Lake Ontario, and west of Cayuga lake. Their oldest traditions established them on the fertile lands between the Seneca and Cayuga lakes, from thence gradually extending their power and control to the Niagara, and along the shores of the Allegany; and it is worthy of remark that the Senecas generally selected, with singular discrimination, the most fertile and productive soils for their permanent abodes, an evidence of sagacity, and of agricultural pursuits. In all past time, the northern race of Indians esteemed themselves a peculiar people, a race far above all other red men, excelling as much in intellect as in strength. When speaking of their tribes, they used the term "ongwe honwe," as characteristic of, and implying superiority. The Senecas appreciated and maintained this superiority, carefully fostered national pride, using every influence to perpetuate it. Not less careful were they to encourage energy of mind and body, and a devoted love for independence. We find this character of the Senecas strongly portrayed in their declarations to the assembled chiefs of the British forces at Albany in 1684; a council at which an agent from the French settlements of Canada was also in attendance. Upon that occasion a Mohawk chief, with dignity and grace, presented beaver skins to the English commissioner, and said, "We present these three skins as a token of our gladness that your heart is softened; and these two skins, of our joy that the axe is buried; we are glad that you will bury in the pit what is past. Let the earth be trodden hard over it; let a strong stream run under the pit, to wash the evil away out of our sight and remembrance, and so that it may never be digged up." The Seneca brave rose, with an eye beaming with the wild energy of his nation, and on their behalf said, "*We* have not wandered from our paths; when Onondio, the Governor of Canada, threatens us with war, shall we run away? shall we sit still in our houses? No! our beaver hunters are brave men, and the beaver hunt *must* be free." Another Seneca warrior rising in the circle and turning to the French agent, said, "It is well for you, that you have left under ground the hatchet which has so often been stained in the blood of the French. Our children and old men had carried their bows and arrows into the heart of your camp, if our braves had not kept them

Digitized by Google

back. Our warriors have not enough of beaver to pay for the many arms we have taken from the French; and our old men are not afraid of war; we are born free; we depend neither upon the English, nor upon the French." Such was the language of the Senecas, who were doomed, however, to see their country overrun, and forts erected to keep them in submission. Not long after the council held at Albany, and when the French had established a fort at Niagara, the Senecas advanced to attack it. Commanded by Haaskaoun, they were confident of success; actuated by noble impulses, the chief demanded a surrender of the fort and garrison. A parley was held, when Haaskaoun, with haughty brow and fierce glaring eye, declared to the commandant of the fort his views and resolution. "I have always loved the French," said he, "and our warriors are here to burn your fort, your houses, barns, and corn; to weaken you by famine, and then to overwhelm and destroy you; I am come to tell you that you may escape this misery, if within four days you yield to our terms; restore our kidnapped chiefs; every spoil taken from the Seneca nation; and demolish the forts you have erected." Five hundred warriors, carrying the standard of their tribe, the wolf and eagle, on their broad breasts, awaited the signal of Haaskaoun. But the French quailed beneath his frown, submitted to the terms dictated, and fulfilling every item, left the country south of the Ontario lake, free from French intrusion. Such were the Senecas. Such were the men who once covered and cultivated this county; whose garden grounds, and corn-fields, and apple-orchards are not yet wholly obliterated by the modern plow and harrow. A regret will arise and linger in the mind, that the council fires of such a nation are forever quenched; that the smoke no longer curls from their domestic hearths; that the Brave and his red race have gone like chaff before the wind.

The traditions of a people who have so recently faded away, are not without interest, possessing also a charm of wildness and romance, and from which may be discovered types and allegories full of meaning, curious and instructive to the philanthropist.

A tradition of the Seneca nation, and one held by most of the Six Nations, is, that in the beginning two worlds existed, one inhabited by man, the other by monsters, living in darkness and deep waters.

In the advance of time, the lower world was fitted and prepared as an abode for the human race. To people it a female descended from the upper world, and found a resting place on the back of a tortoise; here she gave birth to twins. The one called USSKOSS, (Good,) the other TAUTAOKOS, (Bad.) Soon after their birth the mother died, when Usskoss converted his mother's head into the sun, the moon, and stars. By their genial influ-

Digitized by Google

ences he drove the great monsters to their hiding places in the deep, and checked the ferocity of the lesser monsters.

The tortoise increased rapidly in size, and ultimately formed a great island.* Usskoss then made the earth, its hills and valleys, its water-courses and lakes, filling them with game and fish. He finally made a man and woman, naming them Ongwee Honwee, or the best of people.

While Usskoss was thus occupied in beneficent works, his brother Tautaokoss was no less industrious in labors to undo or overthrow the work of Usskoss. He created and increased monsters of frightful aspect, venomous serpents, and destructive creatures: every effort was urgently essayed to overwhelm and destroy the man and the woman. Disturbed and wearied with constant struggles for power, a contest at last took place, in which Tautaokoss fell, and was hurled from the island into utter darkness. The triumph of Usskoss, allowed him to perfect his intended works, and committing them to the care of the man and woman, he left the earth. This tradition of the creation of the world is held, with slight variations, by most of the northern nations of the American continent.

Each nation has a tradition touching its own origin at some later period, and the Senecas were firm in the belief that they originated on Nundowaga hill, about fifteen miles west of Seneca lake, and near the site of the beautiful village of Canandaigua. They assert, that they came forth from the hill, and dwelt on it for a time in peace and joy. While yet few in numbers, a reptile was found by the children, and brought within the embankments and trenches of their town on the hill, it became the fondled associate of the young, who nourished it with tenderness and kindness. It grew rapidly, and from its increasing appetite and strength soon required nourishment beyond the powers of children and youth to supply. As yet harmless and a favorite, the men fed it from day to day with game. Becoming vigorous and strong, it now went forth to seek its own sustenance and freedom. At times, sporting in the lake, or ranging the forests, it exhibited a power beyond human control, and a disposition for mischief inconsistent with the safety of the people. The destruction of game also became a source of serious alarm, and induced the people to seek means for the destruction of the creature, so long the nourished inmate of their town.

At early dawn, on the day appointed for the attack, they descried the monster encircling their hill, its enormous jaws opening as it were in defiance, in front of the gateway or passage of their entrenchments.

Undaunted by this formidable foe, arrangements were made for a vigor-

* The Indians have ever believed this continent to be an island.

Digitized by Google

ous sally; previous to which, some endeavored to escape by climbing the monster's scaly sides; but in all directions they were thwarted and thrown back from his wreathing folds or coils. Urged on by hunger, impatient of restraint, the whole tribe made a vigorous onset, rushing with desperation into his very jaws. None returned that day to their homes; all fell a sacrifice to the monster; all were swallowed by his capacious stomach, save only one woman and her two children, who effected their escape.

Gorged with his feast, the monster reptile rested for a day and night undisturbed. In terror, the woman and her children found shelter in the forest. Overcome with sleep, a vision warned her to provide arrows of a peculiar form, for herself and children; at the same time, she was instructed how to use them with effect, and where to plant them with fatal consequences upon the monster. Carefully complying with the injunction thus received, she fearlessly sought the monster which held his watch around the hill. The charmed arrows sped with unerring aim, penetrating beneath the shining scales, reaching the creature's heart; in agony, it lashed the steep hill side; breaking down the forests, and plowing deep furrows in the earth. Rolling down the hill slope, it plunged into the lake; wild with distress, and with convulsive throes, it disgorged its human victims near the shores: at length, exhausted by pain, and yielding to the effect of the charmed arrows, the monster gradually descended to the bottom of the lake. On the shores of the Canandaigua waters, rounded pebbles, of the size and shape of a human skull, are numerous at this day, which the Indians affirm are the petrified skulls of the "people of the hill," disgorged by the monster. The woman and her children removed to the banks of the Seneca lake, and from them originated tha late powerful Seneca nation.

In these rude allegories, it is easy to trace points of unrecorded history, obscured by the mist of time, yet interesting to the antiquarian and philosopher.

The condition of Indian art anterior to the arrival of Europeans, was limited by the few wants or demands needful for their mode of life. Machinery or implements for trapping or killing game, implements for the preparation of clothing, and tools few in number, for the mechanic art, were the most important objects. Architecture was confined to walls of earth or slight frames of wood, covered with layers of bark. Soon after the landing of Hudson, and Champlain, the amulet of shell, and carved pipe of Indian handiwork, gave way to foreign ingenuity in the engraved medalion and the moulded pipe bowl: the personal ornaments of shell and bone curiously and often elaborately wrought, yielded to beads and tinsel trinkets: the coarse clay pottery of their dwellings, was

Digitized by Google

rapidly exchanged for the brass, copper, or tin kettle: the tempered hatchet took place of the stone tomahawk; and the axe became a substitute for the stone gouge or chisel used in felling trees. Awls and needles made from animal bones, or from the bones of fish, were no longer favored by the Indian woman; the steel needle alone would now be used. Like multitudes of men in many parts of Europe, the American native adhered with superstitious veneration to charms, amulets, necromancy and witch-craft; these were firmly fixed in their belief, as like errors, in the minds of their white brethren during the dark ages, and held with as much tenacity as disgraced the early days of the eastern settlements when Salem witch-craft found ignorance and folly, blind enough for belief, and barbarity so great, as to jeopard life for dreams and visions. It was by an artful, possibly a conscientious encouragement of superstition, that the Dutch and English, advanced the success of their trade and traffic with the Indians; the power to ward off evil, ascribed to bones and shells, gems, beads and crosses, rendered these baubles of inestimable value to the confiding native, who was ever ready to part with his beaver or bear skin for a relic to propitiate the Great Spirit. These ornaments, with silver bands for the arms and wrists; gorgets and other objects for adornment, gave activity to the European workshop; and by degrees, supplanted the waist cloth of skins and fur leggings; cotton and linen fabrics early graced the fine forms of the women, and woolen cloths protected the stout broad frame of the Indian man.

At this day the arts of Indian life (as they existed in 1600), are to be found only in collections made from ancient grave-yards or tombs and mounds; for the Senecas of 1700 had extensively adopted the arts, if not the customs, of Europeans.

The Senecas, and northern Indians generally, held and maintained a belief in future rewards and punishments, and the immortality of the soul; their notions of morals, conducing to secure reward, are chiefly connected with such requisites as fit men to support life or punish agression, which may be comprised in the qualities of a good hunter and a brave warrior; the absence of these qualifications renders the unhappy delinquent, discreditable on earth and punishable in the land of spirits. Good and evil spirits abound in their system of religion; these good spirits are ever in communion with their chief priest, or medicine man, while the evil spirits are checked or subdued by his charms, his spells and ceremonies.

Hence, it was the interest of the chief priest to inculcate and foster superstition, to feed love for the marvelous and mysterious.

The office of chief priest secured for the incumbent the reverence of the people who received through him the favor of the great spirit, invoked by aid of

Digitized by Google

charms and magic spells; in him the people saw the type of the benign influence and aid of the supreme power or the great spirit. At an appointed day in every year the priest performed a sacred service, alike in every habitation; at early dawn every fire was extinguished, every hearth was cold; ashes and cinders were strewn around, discomfort and misery seemed to prevail. The venerable man with measured step entered every dwelling, he solemnly and fervently invoked the great spirit in behalf of each family; striking a light, a new fire was kindled by him on the domestic altar, with a prayer for its continued comfort through the year. The lodge was swept, the feast prepared, and peace, joy and content prevailed. Thus was the bond of allegiance annually renewed, and reverence maintained.

It is not unreasonable to ascribe to Indians of sagacity and vivid thought, an intent to typify by this service, a special influence of the Creator. To them fire was the source of comfort and enjoyment: the sun being to them the great source of all heat: fire became the symbol of the sun's influences, while its absence indicated desolation, want, and death. The ceremony seems to justify this belief. One among many similar stories illustrative of the force of superstition in connection with the foregoing, will sufficiently exhibit the Indian character as existing about the year 1700.

It has been asserted with full credence that a man and his wife with a friend, took shelter for a night in the "house of the dead" in Oneida; after the fire was covered, and sleep was heavy on them, a noise was heard as of a person gnawing and eating, starting from the mat or bed, a fire was rekindled, when they discovered that the flesh of one of the dead persons had been the feast of a ghost. But the following more circumstantial account is given by a Seneca: "A hunter and his wife were overtaken by darkness and a rushing storm. A dead house offered the only shelter. In the night the wife was alarmed by sounds resembling eating and drinking; the sounds were near and distinct, but nothing could be seen; kindling a fire, she found the blood of her husband flowing over the ground; he was dead, and partially devoured by a ghost, or spirit. She fled in consternation, but soon heard the whoop of the ghost behind her. Every exertion was used for escape, but some mysterious agency alone preserved her."

Puerile as these legends undoubtedly are, it must be remembered, they are the Indian superstitions of the seventeenth century, and should not prejudice the mind in 1850, when studying the habits and manners of these sons of the American forests. In truth, the contrast is not unfavorable to the latter, when placed side by side with the mythology of northern Europe, or contemplating the extent and horrors of the scenes exhibited near the close of the sixteenth century, when five hundred human beings were burned

Digitized by Google

as witches, at Geneva, within the short space of three months, and one thousand victims were destroyed in the diocese of Como. In England, the like events were not less discreditable, nor were they finally checked in that country till 1701, by the firmness and mental vigor of Chief Justice Holt. The last victims in England were in 1716, when a Mrs. Hicks and her young daughter were hanged, for selling their souls, and raising a storm by pulling off their stockings and making a lather of soap. In this country, the negative merit may be claimed, that no judicial executions occurred after 1692. Happily, with rare exceptions, the insane fancies of diseased minds, and the artful machinery of malignity, knavery and hypocrisy, have no hold upon the mind of the people of this country; and the history of such dreadful folly is read with regret for the past, and hope for the future.

CHAPTER IV.

The long continued enmity between England and France, which was calmed by the treaty of Ryswick, (1697,) broke forth soon after the death of William III. (1702.) The constant struggles of France and England for power, engendering almost an hereditary hatred in the bosoms of their people toward each other, may be viewed as one potent influence to retard the progress of civilization; without interest, without any common sympathy, the discoveries and improvements of either, were carefully denied to its neighbor. This impolitic and suicidal course continued down to the last forty years.

The same destructive and grasping policy marked the progress of the American people, under the government of Great Britain. The unceasing attempts of the colonial governors to obtain superiority—the rival claims of the two belligerent nations, to the profitable trade in furs—produced violent collisions, and murderous frays, between the Indians and the traders of both nations.

The active, restless spirit of French enterprize, had early won for them the affections of the Seneca nation. The facility with which they entered into and adopted the habits and customs of the Senecas, even their dress, gave them a decided advantage over the more phlegmatic Dutchman or Englishman. The gaudy beads, the useful copper kettle, the polished tomahawk, and ornamented scalping knife, opened an easy road for the French, along the margins of the great lakes, and the shores of the Alleghany and Ohio rivers, on the banks of which floated the flag of France.

Digitized by Google

The same enterprise planted a French colony at the mouth of the Mississippi. New Orleans opened to them new and broad avenues to Indian traffic, and to the establishment of trading posts, defended by forts, in connexion with those on the Ohio.

Thus hemmed in, or surrounded, the trade of the forests flowing to the St. Lawrence and Mississippi; the colonial governors demanded a withdrawal of the French forces from the Ohio. Pretexts for non-compliance were not wanting, but the delay caused Virginia to present an opposing force to the encroachments of the French upon her borders. Troops were raised, in 1754, and entrusted to the command of Col. Washington. With only four hundred men, he traversed the forests and wilderness, until he reached the forks of the Alleghany and Monongahela rivers. At this point, or near it, the French had erected Fort Du Quesne, being the site where the city of Pittsburg now stands. Here he encountered a formidable and overwhelming force, under De Villiers, who compelled him to retire, after exhibiting a skill and bravery indicative of the hero, destined to fill so large a page in the history of this country.

This event was followed by the more extensive preparations for driving the French from their posts on the Ohio, under General Braddock, (1755,) who moved on Fort Du Quesne with twelve hundred men. Gen. Braddock had already won laurels elsewhere; he was, unquestionably, a brave man, and versed in the arts of war; yet he unaccountably suffered his progress through the forests to be unguarded, and he fell into a well planned ambush of the Indians. Concealed behind trees and rocks, they poured a deadly fire into his ranks; confusion ensued, and a frightful carnage closed the scene, (9th July, 1755.) General Braddock was wounded, carried from the field, and died in a few hours.

These collisions between the colonies of England and France served to embitter the parent nations, and fierce war raged between them. For four years New-York was the theatre of war, until the campaign of 1759–60, when the fall of Quebec led to the extinguishment of French power in Canada. This heavy loss of colonies, of trade and traffic in America, paved the way to a restoration of peace, which was concluded in 1763, and signed in Paris.

It has been seen that the introduction of fire-arms among the Indians, with other arts, soon after the discovery produced a most important change, operating to the disadvantage of the white man; the Indians soon became expert in the use of the death dealing musket. The Seneca nation became as unerring in aim with the rifle, as with the tomahawk; though the latter, and the knife were constant appendages, and favorite weapons, when the

Digitized by Google

foe was within reach. The varying success of the contending foreign rivals, taught the Indians lessons of policy and strategy, if not of mercy. It is painful to be assured that, with all the acts of atrocity so liberally ascribed to the Seneca Indians, and to other nations, the white man too often *exceeded* them in ferocity and atrocious acts of barbarity.

The knowledge of Europeans, thus imparted to the Indians, and its influences, served to encourage the hope of more certain means for the extermination of the white man; a hope long cherished by nearly all the nations west of the Oneidas, and now tending to a united effort. A wide extended coalition, of western nations, drove in the distant settlers, and the Indian forces reached the borders of the settled counties.

Since the peace of Paris, in 1763, the colonies had felt great relief from the dread of a savage war, fomented and led on by French intrigue. The jealous feelings of the Indian could be appeased, for a time, at least, by a trade in trinkets and baubles, and they could be kept in check along the borders by a show of power.

During this period of relief, the colonies began to unfold and mature those seeds of independence which were planted by the puritans, and had found a congenial soil in all the breadth of the land. Inured to hardships and privation—possessing high spirit—the people did not hesitate to complain of the unequal and unjust burthens imposed on them by the English government, nor to claim a voice in the administration of their own affairs.

The determined endeavor of the crown to impose taxes on the colonies, and to restrict all commercial intercourse with the mother country, roused the anger of the people. Quarrels often occurred between them and the soldiery, until 1770, when a serious fray took place in State street, Boston. The drums beat to arms—the people collected—the troops fired on the assemblage, and many lives were lost. The result was, a prudent relinquishment, by the government, of many of the burthens recently imposed; an act which confirmed the people in the soundness of their cause, and sanctioned them in rigidly maintaining and asserting the principles they had adopted.

The political condition and final overthrow of the Seneca nation are so closely interwoven with the events and results of the struggle for the supremacy of freedom, that a few of the prominent incidents may be consistently related here, as tending to explain the causes leading to their expulsion, as well as the rapid introduction of art and science, with the officers and armies sent hither by England and France; the one to resist the progress of civil liberty, the other to aid in its protection and advancement.

The years 1772–3 were marked by an evil not unknown to the commer-

Digitized by Google

cial men of later times, in this country as in Europe—an over-trading or undue application of labor beyond the natural wants of the people for the object produced, or introduced, and in excess. Such was the condition of England in 1772–3, in regard to Asiatic productions. The British East India company had overloaded their extensive warehouses with tea and other products from China and India. As one mode of relief, it was determined to send the surplus to the colonies in America, in direct opposition to the existing and well known order of exclusion emanating from the people.

The first arrival of this excluded article of luxury, was in November, 1773. Every argument was used, every peaceable effort was urged to induce the parties who represented the property to cause the return of ship and cargo to England; no honorable means were left untried, to avoid the consequences of a landing. It was felt that the day had arrived when the principles so long cherished, must be maintained by a force stronger than argument. Having carefully considered their position, and maturely weighed the issue, the people, by a unanimous vote, determined to prevent the unlading of the ship in the port of Boston. To avoid delay and idle negotiation, the populace crowded to the decks of the vessel, opened her hatches, and threw the contents of every tea chest into the river. Having thus accomplished the object, they retired quietly to their homes, regretting the necessity for the act, but determined to maintain their independence. The same spirit, which from the landing at Plymouth rock, in 1620, had from year to year increased in vigor and energy, now spread through the land, nerving every honest breast to meet firmly and bravely the coming storm. Those who had basked in the sunshine of court favor, and the timid few who feared the power of Britain, adhered to the royal cause; but the mass of men, possessing property, knowledge, and influence, in all the colonies, zealously supported the cause of the people.

The events of 1775 opening with the battle of Lexington, followed by the battle of Bunker Hill, led the public mind to full and open discussions of the advantages of unfettered trade, the right to govern and administer their local governments; the right freely to enjoy life, liberty, and the pursuit of happiness. These rights thus openly and freely discussed, caused a first movement in favor of a formal declaration of independence to be made in congress by a Virginian,* a proposition which found an approving spirit in the whole people, and was formally adopted and declared on the 4th of July, 1776. These events led to the entire emancipation of the people from foreign rule, and the establishment of this republic.

* Richard Henry Lee.

Digitized by Google

The contest for freedom was marked with scenes of peculiar ferocity, perpetrated by those who adhered to the British cause. The Indians, with few exceptions, accepted the courted alliance of the English commanders, and under their guidance or sanction committed outrages and enormities of unparalleled magnitude.

Not more than seventy years have passed since the massacres at Wyoming presented a scene of fury and horror so great, that not a vestige of that settlement was left; the Indian tomahawk, with fire, and the tory sword swept every living thing and habitation from that beautiful valley. In the same year the inmates of Cherry Valley were roused from their sleep by the war whoop of the Indians, and English soldiery, dealing death and destruction to unarmed men, their wives, and helpless children.

The warrior Brant, with his Mohawks and Senecas, hovered on the borders of Albany; and at that comparatively recent period it was declared by General Schuyler, that unless some exemplary blow should be inflicted on the hostile Indians, Schenectady would shortly become the boundary of the State. The border incursions of the Senecas were carried into Ulster county; Kingston was kept in alarm and attacked; Minisink, near Goshen, and Pulaski, were burned and laid waste. For many years the bones of the slain lay bleaching on the field, until 1822, when the citizens of Orange county caused them to be collected and buried.

The unwearied efforts of the enemy to harrass the people of this State, by means of predatory eruptions from Canada, aided by their Indian allies, called for effective relief. Congress felt the necessity, and issued the needful authority. General Washington selected General Sullivan to chastise the Indians, and drive them far from the county borders or settlements—to destroy their towns, and remove every means which could facilitate or contribute to their residence in the Seneca country.

To effect this object, an army of five thousand men was raised, of which two thousand, under General James Clinton, ascended the Mohawk river as far as Canajoharie, from whence he transported his batteaux, stores, and material a distance of twenty miles to Otsego lake, he embarked upon its waters, and passing down a branch of the Susquehannah river, formed a junction with the main army under General Sullivan, near the forks of the Tioga. The army then advanced into the Indian country, (August, 1779.) The Senecas had been apprised of the movement, and procured the assistance of the British officers, Colonel Guy Johnson and Colonel John Butler, with other officers and their troops. Brant commanded the Indian forces, and determined to give battle on the banks of the Chemung, at a place then called Newtown, now known as Elmira. Every preparation was made,

Digitized by Google

a breastwork about half a mile in length was thrown up—the ground was masked by pines of a stunted growth, and many small shrub oaks were stuck in the ground, better to conceal their position; sentinels were posted at short distances, and on every hill. Thus prepared, and trusting to their defences and skill, they waited the approach of the American army.

Near noon on the 29th of August, Major Par, who was with the advanced guard, discovered the works and position of the Indians and English. Halting for a short time for the nearer approach of the main force, arrangements were made for attack. It was led by Generals Hand and Maxwell, in front. For several hours the resistance was obstinate and bravely maintained; but the Indians and allies being worsted, fled, and although a large part of their force was saved by crossing the river, many lives were lost in the battle and in eagerness to escape.

General Sullivan advanced his army to the head of Seneca lake, destroying the town of Knawahole, and Catharines Town, (Havanah,) with their extensive gardens, and rich corn-fields. Catharines town, near the margin of Seneca lake, was held in esteem as the residence of Catharine Montour, under whose influence the place had grown into comparative wealth and importance. Catharine Montour was the daughter, (as believed,) of Count Frontignac, one of the French governors of Canada. Her complexion indicated European blood, and her infancy was nurtured in comforts unusual among Indian tribes. During the wars which raged for a time between the Senecas and French, Catharine Montour was captured, then about ten years of age, and carried into the country of the Senecas. There she was adopted, and reared, early exhibiting an energy and spirit, admired by and worthy of the haughty nation which now claimed her as their own.

A chief of renown, and distinguished as a Seneca warrior, became the husband of Catharine Montour, as soon as she reached womanhood. Her beauty and bright spirit lent a charm to her natural grace, which, aided by a strong mind, gave to her a wide spread influence. In the wars with the southern tribes in 1780, her husband was slain in battle. Two sons of Catharine Montour were bold and prominent actors on the war paths. One was actively engaged at the Wyoming tragedy; the other in the attack upon Cherry Valley. It has been said that Catharine often joined in the hottest contests fearless alike of the hatchet or rifle ball, but when it is remembered that this female was received and caressed by the ladies of Philadelphia, that she participated with ease in the refined and luxurious entertainments of the wealthiest citizens, and with a politeness of manner and grace equal to the most polished, it is difficult to credit the ferocity ascribed to her. After the dispersion of the Senecas from this region, Catharine

Digitized by Google

Montour, with her sons, resided at Niagara, and in that fortress was received and entertained with respect by the British officers.

The entire destruction of Catharines town, and flight of its inhabitants, carried terror through every village to the outlet of the lake. The old men and women were sent rapidly forward in the hope of the warriors making a stand against the foe at or near the present site of Geneva. The American army pressed forward between the Cayuga and Seneca lakes, driving the Indians before them. Here the lands were found to be cultivated, yielding abundant corn; extensive orchards presented fine fruits to the invaders; the apple, pear, and plum were abundant. A regularity in the arrangement of their houses, indicated long continued prosperity and enjoyment of property. Many houses were rudely framed, with chimneys, and some few were painted; all, however, were destroyed. Nothing was left to afford succour, or inducement to return so near to the American settlements.

CHAPTER V.

Kendaia was deserted by its inhabitants as soon as the residence of Catharine Montour was destroyed. The Indians of Kendaia had selected a fertile position for their town, and bestowed much labor upon the garden and fields; the orchards were extensive and productive, and a portion escaping the general destruction, are now in bearing, as mementos of Indian horticulture. So remarkable was the town for its orchards, that it was often known as Apple town, and even now the name is heard from the lips of the old inhabitants. The day after the destruction of Kendaia, or Apple town, the American army reached the high grounds at the foot of the lake, and encamped on the grounds now known as Rose Hill, Viewfield, Oaklands, and Aubrey farm. On the opposite shore, where Geneva so beautifully rises from the lake and crowns the hill, the Senecas had collected in force. On the 7th of September, Gen. Sullivan ordered his army to advance; they crossed the outlet of the lake without opposition, reached and destroyed Kanadaseaga, and moved upon Canandaigua, destroying the settlements between Seneca lake and the Nundowaga hill. At the same time a detachment under Colonel Harper, made a rapid movement along the Seneca river, and destroyed Scawas, (Scauyes.)

From Canandaigua the army advanced to Honeoye, a small town which shared the fate of others. The Indians had continued to fly in dismay, and were disheartened; but the rapid advance of the American force, with destruction in its train, roused them once more to think of defence. In the

Digitized by Google

hope of arresting the progress of General Sullivan, the Senecas collected their warriors, the old men, women, and children were sent to a distant place of safety, and hastily prepared an ambush at Henderson's Flats, a point between Honeoye creek and Conessus lake. The American advanced guard entered the ambush, when the wild war whoop and terrific yell, with a fierce and deadly attack, compelled the guard to fall back upon the main body of the army. The red men were too eager for the attack, and frustrated their object by too early springing from their concealment. Unwilling to risk an encounter with the main army, the Indians fell back on the Genesee river, leaving their farms and dwellings to inevitable destruction

During the attack near Honeoye, two Indians, who were employed as guides, acting with the American advanced guard, were captured by the hostile Senecas. Both were of the Oneida tribe, and highly esteemed in the American camp. One of these men had an elder brother in the British service, who had often used cogent arguments to induce the younger to forsake the American cause, and look for favor and higher reward from the British. True to his word, the young Oneida held firm to his promises, and faithfully guided the troops in their advance through the Seneca forests. At Honeoye battle ground, these brothers met in opposing ranks; the younger brother became the prisoner of the elder brother; the instant of recognition was a moment of savage excitement; with haughty mein the the elder brother upbraided the prisoner, and threatened death with the war club or tomahawk; he rapidly narrated the crime committed by leading the white foe to the fields and homes of his fathers and friends, guiding them to the very homes where their mothers and children were to meet death or be driven to new and unknown hunting grounds. "But though you merit death, and shall die on this spot, my hands shall not be stained with a brother's blood. Who will strike?" A bright hatchet gleamed for an instant in the air, in a moment, the young Oneida ceased to breathe—to live.

The failure of resistance at Honeoye convinced the Indians that retreat alone could preserve their lives, they determined, therefore to leave their country to the scourge now sweeping over it. They moved off toward Niagara, leaving bands of warriors to watch the enemy and inflict such annoyance as opportunity might permit.

When the army reached the Genesee valley, all were surprised at the cultivation exhibited, by wide fields of corn, gardens well stocked, their cattle, houses, and other buildings, showing good design, with mechanical skill, and if the language of General Sullivan may be adopted, their fields were fruitful with "every kind of vegetable that could be conceived."

Digitized by Google

Beautiful as was the scene in the eyes of the army, a few days changed it to utter desolation; neither house, nor garden, grain, fruit tree, or vegetable, was left unscathed.

When the warrior chief, Corn-Planter, met General Washington, in 1792, thirteen years after the passage of General Sullivan through this county, well might he be excused for the language which burst from his lips. Kindling with the remembrance of the deep misery endured by his people, he declared that, "even to this day, when the name of the town-destroyer is heard, our women look behind them and turn pale, and our children cling close to the necks of their mothers: our sachems and our warriors are men, who cannot be afraid; but their hearts are grieved with the fears of our women and children."

General Sullivan did not pursue the Indians beyond the Genesee towns; he returned by the same route he had advanced, and reached the outlet of Seneca lake, in this county, on the 20th of September. Crossing the outlet, he camped again on the high ground of Oakland farm. From this point he detached Colonel Zebulon Butler, with five hundred rifles, to traverse the eastern shore of Cayuga lake, and inflict punishment on the tribes of Cayuga, with no less severity than was measured to the Senecas. Colonel Dearborn was also directed to follow the western shore of Cayuga lake, with similar instructions. Other detachments, under Colonels Van Courtland and Dayton, were sent to scour the country around the head waters of the Tioga river, while the main army moved south, passing Tioga on the 30th September, and reaching Easton, in Pennsylvania, on the 15th of October, making the distance traversed to the Genesee Castle, about two hundred and eighty miles. Other incursions were made, in 1779, into the country of the Onondagas, and also along the Alleghany river, exhibiting to the Indians a power beyond their means to resist or control.

By this movement of the American army, the social and political condition of the Seneca nation was destroyed; and by these means, though necessarily severe, the influence of the English nation was curbed and controled; the murderous warfare of the tomahawk and knife, wielded alike by the Indian and ferocious tory, was arrested.

Such were the events, and their causes, which opened to the admiration of five thousand men, the fertile soil of the rich county of Seneca.

Seventy years ago, the red man gave place to the American citizen; nor was it till then, that the foot of the white man trod this soil, except, perhaps, some helpless captive, snatched from a border settlement, or the enduring Jesuit, from France, who silently and adroitly studied to ingra-

Digitized by Google

tiate himself with the natives, adopting their customs, and proffering the comforts and rewards of adhesion to his peculiar and religious views.

Seventy years ago, the timid deer, the otter and the beaver, held peaceful occupation of the soil. The bear and the wolf held unmolested their nightly carousals; the eagle, the swan, and all the feathered songsters of the wood, rejoiced in their ignorance of the rifle, musket, or fowling piece.

The struggles and privations of the people through all the scenes of the revolution, their devotion to their country, their adherence to the principles of freedom, representation, and adjustment of public burthens, did long retard the settlement of this portion of the State.

The remembrance, however, of the pure, placid waters of Seneca Lake, the beautiful Cayuga, the rich corn fields and abundant fruits, did not fade from the minds of those who had traversed the country in 1779, under Sullivan. Many who then shouldered the musket or the rifle, and those who wielded the sword of command, were eager and prompt to return and realize their early visions, as soon as peace with Great Britain released them from the exertions due to the defence of their country.

Hostilities with the Indians did not terminate with the declaration of peace, for their friends and allies who treated for peace and obtained it regardless of Indian rights, their homes and hunting grounds, made no stipulations for their safety or security.

On behalf of the United States, humanity and a lenient policy toward the natives, was adopted. General Washington ever expressed a desire to look favorably upon these children of the forest, with a hope that the arts of peace might find in them as fervent admiration, as had characterised their nation through so long a period for the pursuit of war.

It was not possible to heal their wounded pride nor overcome the effect of that extraordinary neglect manifested by their allies, the English, until the year 1784, when a treaty was concluded between the six nations and the United States, whereby the Indians, acknowledged allegiance to the general government, and ceded to the State of New York the lands lying *east* of Seneca lake.

Moodily they brooded over their losses, and fall from power, while the tide of emigration began to press them from their accustomed seats. Encounters, and too often death, were consequences of nearer approach, until the stream of population reached the banks of the Ohio, in 1786. Then the Indians were roused to maintain the boundary limits of the whites, which they claimed to be the Ohio river. Sharp and destructive collisions ensued, fomented by the British officers, in Canada, who unjustly had yet

Digitized by Google

retained possession of Niagara and other western posts. These difficulties were increased, in 1789, by fraudulent purchases of lands by speculators.

The Senecas, more than any other Indian nation in New-York, felt oppression, and one of their chiefs thus eloquently poured forth their grief, at a council, in 1790: "You told us that we were in your hand, and that, by closing it, you could crush us to nothing; and you demanded from us a great country, as the price of that peace you had offered us—as if our feebleness had destroyed our rights. 'Tis true, our chiefs had felt your power, and were unable to contend against you, and *therefore* they gave up that country."

Such was the feeling of the Senecas, and the inhabitants of the whole western wilds, when speculation, and the far-reaching minds of the white men, dwelt upon visions of counties, towns, cities and villages, which were to follow in the swelling tide of emigration from Europe, to cover the land.

Various intricate questions, as to jurisdiction and proprietorship of the soil, had for a time excited uneasiness between the neighboring states of New-York, Pennsylvania, Connecticut and Massachusetts. Happily, that spirit of compromise and just feeling which has so strongly characterized the people of the United States, led to an adjustment of all these difficulties, (1786.) Doubtless the difficulty of adjustment had an influence upon the minds of the Indians, who thus witnessed the division of spoils, wrested from them, among wrangling parties.

English patents, for large tracts of land, had been issued in so loose a manner as to cause conflicting claims, and as the facts became apparent, they engendered hopes in the minds of bold and unscrupulous individuals, to aggrandize themselves at the expense of the Indians. In one instance, a company was formed by the residents of Columbia county, to circumvent a statute, which forbade any purchase from Indians in the State, by bargaining with them for *a lease* of their territory for nine hundred and ninety-nine years. The position and influence of the persons forming the company concerned in this improper proceeding, caused much anxiety among people of correct views. Surprise and apprehension were loudly expressed, and by seasonable representation to the Legislature, (1788,) means were devised to avert the evil.

More just views prevailed from that time, and the pre-emptive rights of Massachusetts to lands *east* of the Genesee river, passed to Phelps and Gorham; while the remainder of the territory, lying *west* of the Genesee river, passed, under the same authority, in 1790, to Robert Morris, of Philadelphia. This last tract reached from the Niagara river, and from Lake Ontario to Pennsylvania, and contained about four millions of acres.

Digitized by Google

In 1792, Mr. Morris sold an extensive tract of territory to the Holland Land Company, but was not able to induce the Senecas to relinquish their title until 1797, when it was accomplished by the sagacity and perseverance of Mr. Thomas Morris, who had long lived among the Indians, and was highly esteemed by them.

A trait of Seneca character was exhibited at the council of 1797. When Mr. Morris, in the course of argument, stated that—"The land could have but little value to them, in its present condition, that it was the consciousness of ownership which alone gave it value in their eyes;" a Seneca chief replied: "*That* knowledge is every thing to us. It raises us in our own estimation—it creates in our bosoms a proud feeling, which elevates us as a nation. Observe the difference between the value of a Seneca and an Oneida; we are courted, while the Oneidas are considered a degraded people, fit only to make brooms and baskets! Why this difference? It is because the Senecas are known as the proprietors of a broad land, while the Oneidas are cooped in a narrow space."

In 1790, Robert Morris purchased from Phelps and Gorham about one million two hundred thousand acres, which were afterward sold and conveyed to Sir William Pulteney. These extensive operations covered the whole Seneca country within the State of New-York. The Indians became parties to the transfer, reserving such portions, at selected points, as were deemed sufficient for their numbers, now reduced to very narrow limits.

Thus ended the existence of the Seneca nation—thus the extinguishment of the once powerful confederacy of the Six Nations. What a chain of emotions thrill through the mind, when the sorrows of that race are allowed to flow in native eloquence from their lips. "Who is it," said a noble Seneca, "who is it that causes this river to rise in the high mountains, and to empty itself into the ocean? Who is it that causes to blow the loud winds of winter, and that calms them again in summer? Who is it that rears up the shade of those lofty forests, and blasts them with the quick lightning at his pleasure? The same spirit, who gave you a country on the other side of the waters, gave this land to us, and we will defend it."

But with the white man came civilization, and at the same time the vices peculiar to civilized society.* Distrusting the benefits of civilization, which were exhibited only through the medium of reckless border men, and ever attended by a keen rapacity to obtain their lands, it became to them a scourge, a besom of destruction; and when, at last, the great body of the nation had gone "to join the spirits of their fathers"—when their

* Dr. Kirkland.

Digitized by Google

leaves and branches were withered and shaken by every breeze, the Seneca Red Jacket feelingly deplored the fate of his people, saying: "We stand a small island in the bosom of the great waters—we are encircled—we are encompassed. The evil spirit rides upon the blast, and the waters are disturbed. They rise, they press upon us, and the waves once settled over us, we disappear forever. Who then lives to mourn us?—None. What marks our extinction?—Nothing. We are mingled with the common elements."

CHAPTER VI.

The agricultural condition of the Indian nations has been incidentally alluded to, and evidence given that the cultivation of the earth must have been for ages an employment among the natives who occupied the country comprized within the bounds of Seneca county.

Indian corn, the Zea maize of botanists, was found as a common food, when Europeans first landed in New-York. Extensive fields of this grain were cultivated, and the grain preserved, affording a frugal and very nourishing food to the people, whether engaged in the chase or on the war-path.

At an early treaty, the natives taunted the Dutch settlers with ingratitude, reminding them of the hospitality freely extended to them on their landing, and the large supplies of *corn* and *beans* furnished to them in their necessities.

Well defined evidences of agricultural industry may be traced even at this day, in their ancient cornfields. At the early settlement of the Oneida nation, about forty miles from this county, there is the appearance of a former cornfield; the hills are large in circumference, and with some attention to regularity in distances. The field, when visited by Commissioner Schoolcraft, was overgrown by a forest of timber; a black walnut tree had been partly cut through, and broken down, exhibiting the rings or layers of woody fibre by which its age was ascertained to be about two hundred and forty years; this guide, and every indication of the ground, warranted the conclusion, that corn had been planted on that field before the year 1555, which was forty-four years before the discovery by Hudson. An old Oneida Indian stated to Mr. Schoolcraft, that "in ancient times the corn hills were made so large that three clusters of stalks were raised on each hill, and that the hill, once prepared, was used year after year, causing them to be kept large, and accounting for their distinct continuance to this day.

When Cartier visited Hochelaga, now called Montreal, in 1535,* that town was situated in the midst of extensive corn fields; the houses of the Indians

* Clinton.

Digitized by Google

were large and commodious, "well and cunningly put together," he found the natives devoted to husbandry and fishing.

Le Moine, navigated Lake Ontario in 1653, and landing among the Senecas, they gave him "bread made from Indian corn, of a kind to be roasted at the fire."

Many interesting and amusing inquiries have been diligently pursued as to the indigenous character of Indian corn, an article now become so important for food of man and animals in both eastern and western hemispheres; but from the facts stated, and the fact that Columbus found this grain when he first visited the western world in 1492, and as Indian corn was always found among every nation of this continent when first visited, no room is left for doubt as to its being an indigenous grain of America.

The potato was undoubtedly known and cultivated from an early age. It was carried to Europe in 1565, by Hawkins, from Santa Fe, but did not attract notice until introduced by Sir Walter Raleigh from Virginia, in 1586, and was then known by its Indian name of "openawg," the name by which that tuber is known to this day by most of the northern tribes of Indians.

Beans were found in this State by the earliest adventurers, though no strong reasons exist to doubt their introduction by the Spaniards or French. The forests yielded a plentiful supply of wild fruits, yet when the Dutch and French introduced the apple, the natives propogated it so extensively that when the colonists penetrated the wilderness, large orchards of fair fruit were met in frequent succession. Thus it is evident that notwithstanding their constant wars, and migratory hunting excursions, husbandry engaged their energies, nor can it be doubted, that if the advantages of civilisation could have been presented to them unmixed with error; the labors of the field and the workshop would have been distinguished by a success, commensurate with the spread of knowledge among them.

The intercourse maintained between the native villages and settlements was active and frequent, as indicated by the well beaten trails or roads. The trails leading from the head waters of the Delaware river, through Unadilla, and from the forks of the Susquehannah, at Tioga point, formed a junction near Catharine's Town, thence passing northward through an Indian plantation called "the Peach Orchard," it crossed a ravine at Breakneck hollow, touching Mill creek at Shallow ford, thence it passed to another village known as "Appletown," and trending along and near the western margin of Seneca Lake, it crossed the outlet and reached Canadesaga, now Geneva. The present lake road winding along the bays and inlets of the shore, followed the Indian trail with slight deviations, now passing around the head of a wooded glen, in whose shaded valley, bright waters flowed

Digitized by Google

from its springs, over a shaly bed to meet the pure waves of the never freezing-lake, then winding sharply down the steep-hill, to ascend the not less abrupt and opposite boundary of the valley. The most precipitous of these glens have been rendered easy to pass by dykes thrown direct across them, thereby securing a route nearer to the lake's margin, and presenting to the traveller a varied scene of hill and dale on the east, with rich pastures and wide fields of grain, and on the west tall rocks of crumbling slate, crowned with stately oaks; or points of land jutting into the lake, offering an unceasing variety of light and shade, attractive and delightful to those who value the ornaments which enrich this lake bordered county.

Lateral trails branched off from the main road, leading to orchards, gardens, and corn fields, or to the level lands on the Cayuga border.

Objects of regard and sacred care, among the tribes, were the burial places of their fathers; among the many positions selected by the Senecas in this county, is the field of peace in the town of Lodi. To the Indian it was a sacred and secluded spot of earth, on a point of land between "Mill Creek" and a rivulet that pours its waters into the lake; this point projects into the lake, ever washed by its gentle waves, affording a retired and unfrequented place for Indian sepulture, where the soul was lulled by the murmuring waters, and allowed to prepare for its journey to the land of spirits. A branch trail led to this spot, but the antiquarian, the philosopher, and the man of idle curiosity have ravaged the numerous graves, and have carried off guns, knives, tomahawks, brass kettles, and various domestic articles which had been deposited in compliance with Indian customs, with the body of the dead: but few of the articles thus obtained, had any value, for like the bones of these graves, they were crumbling to dust, but few retaininig their forms after exhumation.

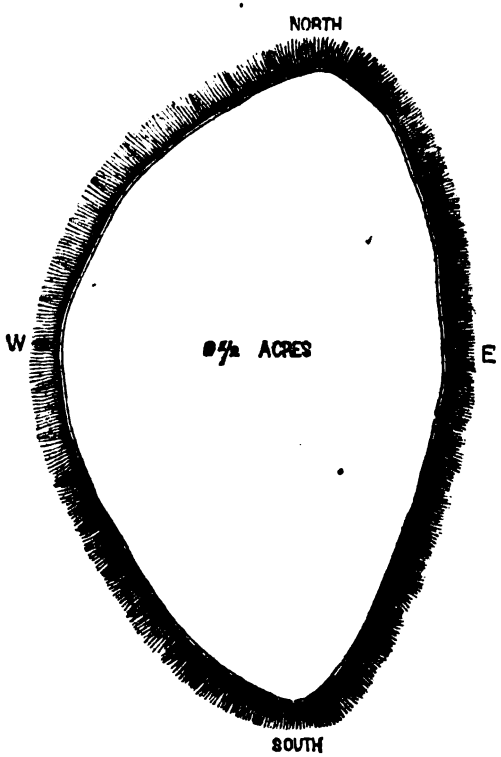
The antiquity of these cemeteries, and of the few architectural relics existing in this county, can be conjectured, only from the vegetable remains which in some instances cover the ruins.

On the lot, No. 29, in the town of Ovid, are the remains of an Indian fortification, covering nearly three and a half acres of ground; the position has a gentle elevation above the surrounding country. The farm, on which this work is yet partially discernible, fell under the plow and harrow about fifty years ago; the embankments have given way, and the thrifty owners have reaped many a rich harvest from ground once trod by the war-like and brave Senecas.

The breast-work was three and a half feet high, with a base five to eight feet wide, surrounded with a ditch four feet wide at top. The area enclosed nearly four acres of ground which was covered with heavy timber; oaks of

Digitized by Google

large size, with maple and bass wood, reared their lofty heads; several old red oaks full three feet in diameter, stood on the embankment; large trees had fallen into and across the ditch, some resting in a partially decayed condition, others mouldering into dust. No traditions exist as to this work, every trace of which will in a few years cease to be. Other ruins of fortified mounds or elevated points exist in the county, too indistinct for description; every town affords abundant evidence of the long continued residence of the natives. Implements of war, as well as those for the chase and the mechanic arts, are yet found when the plow upturns the furrow; but the rude hatchet of stone, the spear head and arrow of flint, the stone mortar and pestle, give no date for determining any period of Indian history.



Remains of Indian Fortification, on Lot 39, Town of Ovid

Digitized by Google

CHAPTER VII.

It has been said of the American people, that a peculiar characteristic marks them individually and collectively, a propensity to migrate. The affection for birthplace, for a home surrounded by the charms of youthful joys and early associations, seems not to possess a restraining hold. The enjoyment of the fruits of early and earnest labor, seems not so great as the pleasure of labor itself, for many are the instances where the comforts of civilized life are relinquished cheerfully, to enter the forests, and press on to their shady depths, there to convert its wild features into the rich productive farm.

In other countries the motive for emigration is usually to avoid evils, which fettered the conscience, or restrained that freedom and liberty which is the birthright of man. In the wide expanse of territory, under the laws of the United States, such evils are unknown; and no similar motive can be found to urge an American from the home of his youth. The man who for many years lived happily and content in the older settlements, with every comfort around his hearth and board, where his annual harvest home exhibited plenty with peace, and moderate labor, finds the position of his sons very different from his own. The old homestead has acquired a value of fifty fold since the forest rang beneath the old man's axe; the products have doubled in quantity since the first fruits were given in return for labor. The young man sees and understands that this increase of capital, of substantial wealth, is the reward of industry well applied. No mystery hangs about its skirts, no rules of any abstruse science are necessary to comprehend and appreciate the causes of this large accumulation. A few days journey farther west opens to the son the same inducements which actuated the father, proffering the same advantages, and the same benefits; he embraces the opening, leaving the home of his childhood, the endearments of a paternal roof for the log hut, and the many though usual hardships of "a settler's" life.

A few years roll on in swift succession, when his sphere of action is increased; moral and intellectual influences had pursued his footsteps; neighbors multiplied in number; villages and towns spring into life; schools and academies rear their fostering heads. A new race is born, and before them falls the dense forest from year to year; the earth is taxed more and more, to yield her bounteous stores, until at length exhausted and impoverished, with no restoration of the elements profusely withdrawn, the crops diminish, and the sons of the proprietor again are tempted, as their fathers were, to seek new lands for cultivation, leaving to the sire the worn soil,

Digitized by Google

yielding less annual product, yet increased in value. In this chain of causes, as well as in the love of freedom, to enjoy fully and undisturbed, in any and every place, the fruits of his own industry, may be traced a cause for the peculiar characteristic of migration belonging to the American people, and to this peculiarity may, in a sense, be ascribed the early settlement of the county of Seneca.

The fertility of its soil was observed and known to many of the officers and men, who traversed its extent under the banners of General Sullivan, and the war path which led the army from the beautiful valley of Wyoming, through the gorges and ravines hollowed out by the waters of the Susquehannah, also led the settler to the southern door of this county.

The town of Lodi, once a part of Ovid, may be called the southern entrance door, through which the early settlers entered. Covert, which is now the southeastern town, and once, like Lodi, a portion of Ovid, was entered by an opening from Ithaca. Time has spared a few who first entered these avenues, and from them are gathered and now recorded the incidents, which might otherwise have slept forever.

In the year 1789, while the exciting narrations of men who were attached to General Sullivan's army, in regard to the rich soil, the temperate climate, were yet fresh; a party of hardy men from New Jersey determined to explore and settle on the lands between the Seneca and Cayuga lakes. Early in the spring they reached and crossed the Delaware river; passing the intervening highlands, they descended into the valley of Wyoming on the waters of the Susquehanna. Embarking on its bosom, they reached Tioga point, now called Athens. As the waters rose from rains, the boats were enabled to ascend the river to Newtown, (now Elmira.) At this point the Indian trail served this hardy band, as it had before done for Gen. Sullivan, a good and direct road to the shores and clear waters of Seneca lake.

The adventure of these persons, its wildness and novelty, attracted admiration, and some of the stout men of Pennsylvania joined in the pursuit of a forest home. From the high lands of Ovid, from the summit of Prospect Hill, the county lay spread out in its beauty at their feet. At sunrise the sparkling Cayuga on the right, gave life to the woody shores, and the eye embraced its eastern shores to its northern boundary; on the left was the clear, bright Seneca lake, its margin studded with dense forests, though here and there "a clearing," or open space, indicated the abode of the Indian, where his garden and corn ground gave evidence of feelings above the savage man. Along this lake the eye is never tired, and from this hill it ranges to where Geneva now stands, the intervening bays and points giving lights and shades of surpassing beauty.

Digitized by Google

It was from this beautiful and commanding range of hills that the white man threaded his way to such positions as suited his imagination, his convenience, or his agricultural views.

Among the first settlers in the southern part of the county, was Mr. George Faussett, whose heirs now occupy the estate of their sire. Mr. Faussett was originally a resident of Pennsylvania. Leaving his wife and child at home, he reached this county early in 1789. Crossing that portion of Ovid designated on the map as lot No. 88, he felt that he had reached the spot most desired, the spot on which his pleasant visions had rested, and to which his more happy destiny had led him.

In accordance with the easy method of occupying land in those days, and not knowing in whom the legal title was vested, Mr. Faussett erected a log hut, covered with bark, and made other improvements and arrangements for future occupation, he then returned to Pennsylvania, where he remained during the winter of 1789. As soon as the snow and ice had passed away, he again entered upon the Indian trail, accompanied by his family, and after a weary journey, reached their new wilderness home. Industry, with frugality, made that home, which was a log hut, not only prosperous; it gilded every passing week and month with joy and happiness. As the harvests returned in succession, the crops of grain would cover more extended fields, and overflowing garners testified the fertility of the soil and the fullness of value in the well applied labor of man. When Mr. Faussett took possession of the soil, it was not known in this region to whom the land legally belonged. After many endeavors the owner was discovered, and Mr. Faussett at once became the proprietor of two hundred acres of the ground he had cultivated. In a few years more the same industry and frugality enabled him to add by purchase, another portion of two hundred acres to his farm. In the cultivation of this estate Mr. Faussett lived to an old age, having passed away from the scenes of his happy labors a few years since, aged 83.* About the same period Mr. James Jackson, traversing the same route from Pennsylvania, settled on lot No. 35, in Ovid. Other settlers arrived, but with Mr. Jackson, remained only a short time and passed away. The venerable Andrew Dunlap, who yet lives encircled in the affections of his children, and children's children, as well as of his townsmen, entered this county among the earliest residents. He arrived by the southern route in May, 1789, and took possession of lot No. 8, in the town of Ovid. On this spot Mr. Dunlap has lived and reared his family. At an early day he purchased the fee of the whole lot, comprising six hundred acres, and for a period of sixty years has witnessed its increase in value,

* The daughter of Mr. Faussett is yet living, and is the first white person born in this county.

Digitized by Google

enjoying the reflection that his energy and industry gave the first impulse to the village of Ovid. Mr. Dunlap was the first man who turned a furrow with the plow between the lakes.* It occurred in the last week of May, 1789, at which time he plowed half an acre of ground, and planted it with potatoes brought by him from Sehshequin, on the Susquehanna. Among the events incidental to a newly opened country, it should be mentioned that Mr. Dunlap's barn served as a court house for several years, the courts being held alternately at this barn in Ovid, and in the corn house of Comfort Tyler, at Aurora.

At the early perird of 1789–90, the settlers were obliged to visit Elmira, (then Newtown,) to purchase provisions and seed grain, a distance of forty miles through a wilderness, and as no mill had yet been erected between the lakes, they were compelled to cross Seneca lake in canoes or boats, and carry the grist to a mill situated midway between Dresden and Penn Yan. Occasional storms, and the severity of winter often prevented a visit to the mill, neither would the labors of spring or harvest time, admit of relaxation sufficient to leave the farm for this staff of life. Necessity gave life to invention, and the "hominy block" appeared. This implement, or mill, was either the stump of a tree, or a portion of the body of a tree excavated, similar to an apothecary's mortar, or a bowl; a pestle also, formed of wood, was suspended over the hominy block, pendent from a horizontal pole, which acting as a spring, and sustaining the weight of the pestle, required but a small force to bruise and grind the corn in the block or mill.

This was one of the many difficulties and resources encountered by Mr. Dunlap and other settlers in 1789. Mr. William Dunlap, who yet lives in the town of Ovid, entered the county with his brother Andrew, and with them came Mr. James Wilson, who, like most of the settlers of that period, amassed sufficient property to allow perfect ease with independence in old age. At the same period Mr. David Wisner settled in Romulus, and Mr. James McKnight in that portion of Romulus now called Varick. The success of the early settlers induced many to look with desire toward this county, and in the spring of 1793, thirty families had become residents of the southern part of the county. At this day it is difficult to conceive the privations and difficulties to which these early inhabitants were subjected. Indian corn, ground to a coarse meal, formed into a paste and boiled, served as food, with an occasional addition of potatoes. Many families subsisted cheerfully on these esculents for weeks. In proper season, venison would grace the board, and bears' meat was at times a delicacy. Their cattle would brouse in the woods, or feed through the summer months on the

* Judge Sackett's address in 1842.

Digitized by Google

natural grasses, giving note of their whereabout, by sonorous bell; in winter they would stray in search of food, and not unfrequently be lost.

In 1792, Mr. Silas Halsey of Southampton, on Long Island, embarked in a sloop for the city of New-York, accompanied by a hired man, and a negro servant. Having reached the city, he transferred his baggage to a sloop bound to Albany; crossing a portage from Albany to Schenectady, over the sand hills and plains, to avoid the Cohoes falls on the Mohawk. He purchased a batteaux at Schenectady, and ascended the river, "poling," paddling and rowing to the place where Rome now stands. Here it was necessary to transport the batteaux on wheels to Wood creek, and again embarking descended the creek, passed through Oneida lake, Oneida and Seneca rivers, into Seneca lake. Skirting its eastern shore, Mr. Halsey reached "Cooley's," since known as Goff's Point, and now as Lodi Landing—making a distance by this route, from his residence, of about five hundred miles. At Little Falls, Rome, Jack's Rift, Seneca Falls, and Scauys, he was obliged to pass the falls and rapids by carrying his boat and baggage across the portages on wheels.

The season was favorable for exploration, and Mr. Halsey selecting a position on lot No. 37, in Ovid, commenced "an improvement;" a small log house was erected, the under brush was cleared off, the stately oaks which for ages had shaded six or seven acres of land were deeply "girdled," and the surface soil was strewed with wheat. This last operation was performed, without any previous cultivation, and the seed was harrowed in, with the rough wooded toothed harrow of that age; it was customary, however, to pass over the ground with the harrow from four to eight times, and to cross harrow the fields.

Mr. Halsey, procured a quart of apple seeds from the Indian Orchard, at Cooley's point, and planted them with care, forming probably the first nursery in this region. Having thus established his "plant," he prepared to return to his home on Long Island. Embarking in his batteau with his men, he passed the Seneca lake and river, and retraced the same route he traversed to reach this county.

In April, 1793, Mr. Halsey left Southampton with his family. On this occasion, his son, with his wife and children; and his son-in-law, with his family, joined the expedition, numbering in all eighteen persons. Embarking in three vessels they pursued the same route as travelled by Mr. Halsey in May, 1792.

After a laborious passage of six weeks, the party landed in the month of May at Cooley's point, and soon reached their new home; here again, untiring industry, frugality, with sound judgment, paved the way to prosperity

Digitized by Google

and enjoyment. The *neighbors* nearest to the residence of Mr. Halsey were James Jackson, one and a half miles west; Elijah Kinne, four miles, north, at the point where the village of Ovid now crowns the beautiful hill; Andrew Dunlap, four miles north north-west; George Faussett, south south-west six miles; Philip Tremain, south-east fifteen miles, at Goodwin's point, on Cayuga lake; and David Wisner, north-east nine miles at Sheldrake point. All the intervening country was a dense wilderness, a mass of trees, shrubs, brush and weeds, so thick and impervious, that the rays of the summer's sun could not penetrate at some points, nor could the eye range beyond the distance of a few yards. This mass of trees and shrubs was occasionally broken by the Indian trail, or the corn fields of the Senecas; these, however, were chiefly on the margins of the lakes, leaving the higher grounds undisturbed except for hunting and trapping.

Judge Silas Halsey, with an enterprise and public spirit which distinguished him through a long and useful life, conceived and executed a plan for erecting a grist mill; it was erected on Lodi creek in the summer of 1794, by the brothers John, Caspar and George Yost; this mill proved an essential comfort to every family, and a source of economy to all.

Before the erection of this mill, the nearest point where grain could be converted to flour, was the town or village of Rome, and one other near Penn-Yan. This latter mill was erected by the followers of Jemima Wilkinson, who left Connecticut in 1789, and following the track of General Clinton, by way of Otsego and Tioga point, reached Geneva in May, from thence, they cut a road to the outlet of Crooked lake, halting there, they made a permanent settlement and erected a grist mill in 1790.

It was at this mill, near Penn Yan, that the first bag of grain was ground in western New-York, and it was to this mill, that the first white inhabitants of Seneca county came with their grists for several years, and until Judge Halsey built the mill above the falls of Lodi. Mr. Halsey died at the advanced age of ninety years.

From the year 1793 to 1800, the constant influx of settlers presented a demand sufficient to consume all the products of labor; yet so rapid was the return of value for the labor bestowed on the soil, that from the year 1800, an export of the surplus wheat and corn took place; Elmira (then Newtown,) was the shipping port, to which place the products were carried with difficulty over a path or track, which was little better than the Indian trail. When the melting ice and snows had filled the river to its upper banks, arks and floats conveyed the articles to towns and villages on the Susquehannah. The returns yielded a profit of fifty cents per bushel to the producer.

The first public meeting of the town of Ovid was held in 1794, at which

Digitized by Google

Judge Halsey presided as Justice of the peace, he was elected Supervisor, and overseers of the highway were chosen, being the first occasion for such officers, as no highways existed by authority before that date, each farmer cut his own road as convenience suggested. It forms a strong contrast with the action of the present day, to notice on the record that six pounds! were voted at this meeting as an appropriation for the support of the poor.

About the year 1800, several families had settled in the eastern portion of Ovid, now called Covert. A track had been opened from Ithaca to Goodwin's point, thence to Trumansburg and across the county to a tavern kept by Peter Smith, two miles east of Lodi; passing Judge Halsey's it opened into the main trail leading along the banks of Seneca lake to Geneva.

Peter Smith, who resided on this road came from Pennsylvania in 1789, early in April, and located on lot number seven. Mr. Smith died on this lot in 1829. Mr. A. Boarman, arrived in this county in the winter of 1799—1800, and in the following spring Erastus Woodworth, accompanied by his father, brothers and a sister, traversing the interior of Massachusetts, followed the course of the Mohawk river to Utica, with a team of horses, two yoke of oxen and several cows, they made their way westward through the wilderness and reached a solitary log house, looking drearily over the position where now stands the beautiful and busy village of Auburn; continuing their progress, they beheld before them the bright Cayuga lake, and at the point where is the village of Levana, they embarked in small boats, landing on the Seneca shore opposite to Himrod's point, they soon found the desired position for a permanent residence, which was purchased, and with subsequent additions, soon brought content, happiness and wealth sufficient for them and for a long line of worthy descendants. The horses and cattle passed round the head of the lake, entering Covert at Trumansburg. About this time Mr. John Letts arrived from New Jersey, and settled in the southern part of the county.

From this period the accession of inhabitants was rapid. The men who had early entered upon the soil were generally a hardy, energetic race, being actuated by motives and circumstances very similar, they felt a mutual dependence, and kindest sympathies, the one for the other. By well directed efforts they sustained themselves and each other in the difficult task of opening and subduing the forests, and laying the foundation of future wealth.

It is due to the early settlers of every town in the county, to record the fact, that with their industry and energy, they brought with them also prin-

Digitized by Google

ciples of rectitude, an instinctive perception of right and wrong, with a knowledge of moral duties, most important to their success and welfare.

As early as 1793, missionaries found a welcome home in these wild woodlands, where by judicious advice and wholesome instructions, they early formed centers of morality, from which its benign influences have been extended to every subdivision of the county, exerting a present influence to prevent error and vice, and inculcate knowledge and truth.

CHAPTER VIII.

To the present generation it may seem incredible, that in the year 1790, only nine hundred and sixty human beings dwelt between the Seneca lake and Niagara river; that in 1792 not a resident could be found established between the Seneca and Cayuga shores, on the line of travel between the Cayuga ferry and Geneva; that twenty log houses and four frame buildings gave the name of village to the now beautiful Geneva. Such was the condition of this region only sixty years ago. But a few years earlier Horatio Jones rested on the banks of Seneca river, where the spindles and looms of Waterloo now speed through their daily duty. He had been long a captive among the Indians, had learned their language, and adopted in part their habits and customs. It was in 1784 that he remained for a season trading goods for furs. Two young men from Connecticut found their way in 1785, with packs of goods, to Canoga, there trading and trafficking for a while with the natives. These men were traders, and cannot be ranked among the early settlers. The first resident in the northern part of the county of whom there is any record, was James Bennett, a native of Northumberland, in Pennsylvania. Mr. Bennett arrived at the town of Washington, (now Fayette,) in the year 1789, and among his first operations established a ferry across the Cayuga lake, a short distance south of the present bridge. Mr. Bennett died in 1827, leaving behind him a large family and a sufficient property.

When General Sullivan returned with his army from the Genesee Valley, and reached the Seneca lake, he detached one hundred men under Col. Gansevoort, to examine the country eastward of the lake. In this detachment was Lawrence Van Cleef, who, when the detachment encamped at Seneca Falls, looked at the rapids, noticed the fall of water, and surveyed the surrounding landscape covered with stately oaks, with feelings of surprise and delight. While standing on the brink of the rapids, the resolution was formed, that as soon as the sound of the trumpet and drum should

Digitized by Google

be stilled by peace, he would settle at this delightful spot. Peace followed, and Mr. Van Cleef, with his family, arrived at the falls early in the summer of 1789. Here he lived a hardy man, too generous to become rich, and died in 1830. When Mr. Van Cleef erected his log cabin at the falls, Mr. John Green established himself on the farm since occupied by Mr. Samuel Lundy, in the town of Waterloo.

The rapids of the Seneca river at Seauys, or Scauas, attracted an industrious population to its vicinity, and a village soon sprang into being. It had advanced so rapidly that the need of a grist mill was much felt. Mr. Samuel Bear determined to erect one of good dimensions, sufficient to supply the wants of all the neighboring country. The brothers Yost were the mill-wrights, who applied themselves diligently upon the frame work, that it might be covered early in the season. The posts and girths, the sills and plates, in short every piece was accurately worked, and was ready to be framed, when it was discovered that all the force of the neighborhood was inadequate to raise the first bent. Mr. Yost was in the constant habit of attending church at Geneva, and while in that place mentioned his dilemma to the officiating minister, who advised Mr. Yost to have boats prepared and in readiness at Geneva on the following Sunday. The day arrived, and after the services were ended, the minister explained the case to his hearers, when a suggestion was made that every willing hand should *at once* be lent to a work of such necessity to the welfare of all. The proposition was adopted by acclamation, the boats were manned, and before darkness had shut out the day, the last bent was raised and the whole frame pinned together. Order, quietness, and propriety prevailed, and the citizens of Ontario returned to their homes, conscious of doing good to their fellow-men, unconscious of error, and trusting that the motive and intention would be viewed with lenity, if not with entire approbation.

The extreme northern towns, Junius and Tyre, though possessing fertile lands, and a soil more easily cultivated than the heavy clays lying south of Seneca river, were not settled as rapidly as the towns bordering on the direct track of emigration.

Seneca Falls at an early day became a center for industrial occupation; the rapids of the river offering a motive power of great value, ingenuity, talent and industry assembled at this point, and accumulation of capital with consequent results are strongly marked, in the array of productive industry as set forth in the statistics of the county.

Waterloo is of more recent origin, and for a time was held in check by speculations, which in some degree interfered with the title and perfect con-

Digitized by Google

veyance of the soil. This impediment having been removed, the village is now bounding forward, and will take rank among the prosperous and vigorous villages of western New-York; this is evidenced by the increase of population of the town since the former census, being a gain of 771; a larger gain than is observed in any other section of the county.

Junius, directly north of Waterloo, became the favored resting place and home of many prudent, cautious men from the east; among them were the family of Southwicks, Carmans, Liskes, Colemans, and others who were early settlers.

The town of Tyre occupies the north-east corner of the county, into which the first settlers entered in 1794; it was at that time a dense forest, where dwelled the grizly bear, and the fierce wild Indian, too savage to associate with his tribe, living almost as an out-cast on the small islands amid the swamps and marshes of Tyre, and on the borders of the river.

The first white man who settled within the limits of Tyre, was Ezekiel Crane, who, with his wife and one or two children, left New Jersey in 1794, and selected the lot No. 48 for their future residence. It has been remarked by Mrs. Crane, that during the first twelve months of her residence in Tyre, she never beheld the face of a white female. In the following year Stephen Crane, (a brother to Ezekiel,) with his wife, her father and mother, named Degarmo, two sons named Peter and Ezra Degarmo, arrived and settled on the same lots; at the same time Asher Halsey joined the new settlement.

The next settlers were Robert Goold, Thomas Sasson, Lewis Winans, Thomas W. Roosevelt and others.

In 1802, Asa Smith arrived from Vermont, he cleared a piece of ground, sowed it with wheat, erected a comfortable log house and returned to Vermont. In April, 1803, he left the Vermont hills for western New-York. His caravan consisted of himself, his wife, five daughters and one son, the latter is Jason Smith, now of Tyre, and for several years a Vice-President and an active member of the county Agricultural Society. They reached their new home in the untrod forest, and found themselves farther advanced in the wilderness than any other white family, subjected consequently to intrusions from the wandering Indians; as an old trail passed near the house, they were often affrighted by a savage head peering through the window, or the muzzle of a rifle presented with a request for food or tobacco, such was the position of a pioneer family in this county in 1803.

Among the Indians who had been permitted to roam freely among the white inhabitants and receive aid and kindness from all, was an elderly Seneca called "old Indian John," he was tolerated for his age, but not

Digitized by Google

esteemed, as his passions were strong and under no subjection; being an experienced hunter, his rifle and knife were worthy of close observation and his skill of imitation. As the frosts of autumn stripped the forests of their gay attire, men prepared for the chase, the Indian and white man alike were incited to prepare their store before the deep snows of winter should drive the game away, or render it more difficult to approach. It was at this season that old Indian John and Mr. George Phadoc agreed to share in the season's hunt. Well prepared, they erected a bark cabin on the banks of the Black brook.

Several days of successful hunting were followed by a sudden change on the part of "old Indian John." The well fatted deer passed him unharmed, the wild birds screamed defiance to his ball, his rifle refused to give its sharp, quick report; sullenly he viewed the fall of game laid low by the true aim of Mr. Phadoc, his eye became fierce with rising passion, the idea of necromancy took possession of his brain, jealousy was roused to hatred, and heated to revenge.

It was after an unsuccessful hunt on the part of the Indian, on the 11th of December, that both returned to their cabin for rest; leaving the game killed by Mr. Phadoc, to be brought in the next morning. The wily Indian was thwarted in every hope of revenge during that night, and disappointment added torture to his maddened brain. On the morning of the 12th December, Mr. Phadoc departed from the cabin at an early hour to bring in a deer, which had been shot the evening previous; returning to the cabin door and stooping to unburthen himself, a rifle ball passed through the game, slightly wounding his side: he instantly drew his tomahawk, intending to despatch old John, but a second thought induced him to seize his rifle and hasten to the white man's abode for relief. Having reached Mr. Asa Smith's residence, the family were alarmed, fearing the well known rage of the old Indian: in their alarm every tree seemed to shelter or hide a foe, but the Indian did not leave the cabin, he re-loaded his rifle, and in patience awaited an opportunity to indulge his ferocious desire for revenge.

Mr. Ezekiel Crane, the earliest settler of Tyre, had successfully opened the forest, and the earth had begun to yield a full recompense to his toils. His wife, who patiently had shared the dangers and privations of pioneer life, now rejoiced in comforts and comparative indulgence, which gave to the past a dreamy existence, a feeling of almost doubt, whether such scenes and hardship could be endured and life continue. Thus happy in the increase of wealth, Crane determined to increase his real estate, and on the morning of Phadoc's disaster, accompanied by Ezra Degarmo, they intended to ex-

Digitized by Google

amine the country for a few miles west, and select such portions as would probably be productive. Well acquainted with Phadoc and old Indian John, and knowing their arrangements for taking game, Mr. Crane determined to stop at their cabin and procure such venison as might be spared. Reaching Black brook, they approached the cabin; Mr. Crane tapped at the door, and in an instant a rifle ball penetrated his left breast and lodged in his left shoulder. He fell apparently dead. Young Degarmo was unable to remove or carry him off, and fearing that any delay would jeopardize his own life, he hastened to rouse the neighborhood and carry the first tidings of the sad event to the family of Mr. Crane. In the meantime Mr. Crane, though mortally wounded, was able to reach the dwelling of Mr. Asa Smith, where he lingered for five days, and death released him from great suffering.

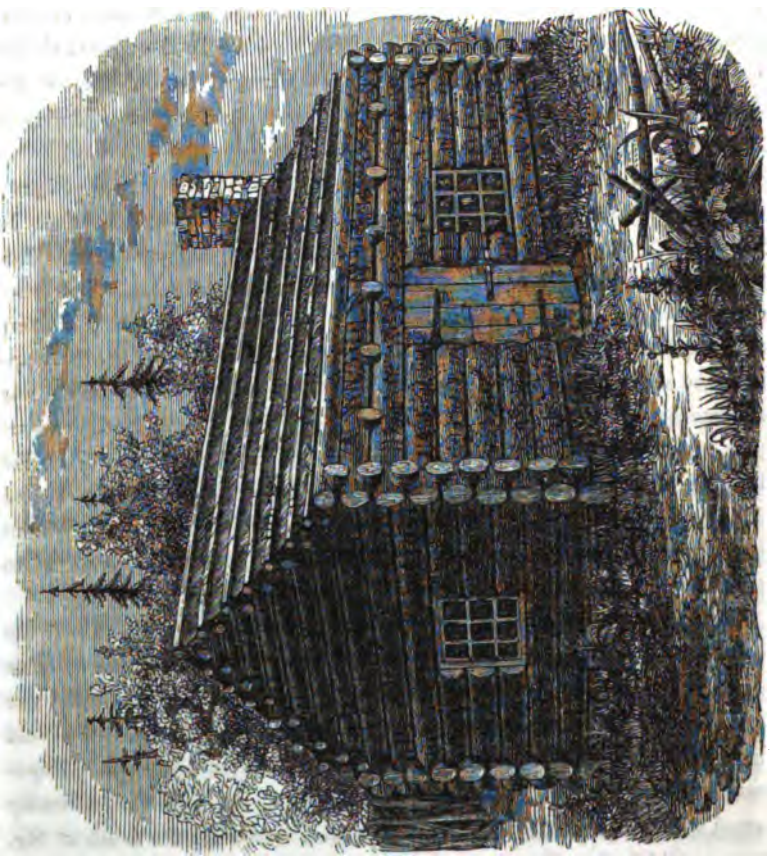
Toward evening of the day on which Mr. Crane was shot, the hardy woodsmen assembled, intending to capture the Indian, that he might be punished by the laws of the land, rightly judging that punishment thus applied, carried with it a terror far greater and more abiding in its consequences than ever flows from hasty illegal acts of individuals. Waiting until darkness might cover their movements, the cabin was carefully approached under cover of the huge trees of the forest. The old Indian was seen standing at the door; with characteristic sagacity, anticipating an attack, his keen eye quickly discovered the motion of dark objects in the distance, and he instantly made the woods ring with the war whoop and shouts of defiance. Impressed with the danger of taking him alive, without the sacrifice of some one or more of the assailing party, it was difficult to restrain the younger men from shooting him as he stood.

With a knowledge of Indian character, the older men had procured the assistance of three friendly Indians, by whose means the old man was first brought to a parley and finally seized, overpowered, and bound. He was carried to the dwelling of Mr. Smith, and there met Phadoc. The old man's rage rose to a pitch of fury at sight of his intended victim. Impotent for harm, a reaction took place, and though he maintained a deadly hatred against Phadoc, he expressed unfeigned sorrow for the death of Mr. Crane. Old Indian John was placed in an apartment constructed within the eastern abutment of Cayuga bridge. The severity of the winter made it necessary to send him for safety to the jail at Canandaigua. In 1804 he was tried and convicted of the murder. He suffered the penalty of the law at Aurora, in Cayuga county, exhibiting in his last moments one of the superstitious characteristics of the Indian. While on the platform it was observed that a pipe and portion of leaf tobacco were in his belt, prepared,

Digitized by Google

as he informed the officers present, to smoke the calumet of peace with Mr. Crane, when they should meet in the spirit world.

The execution of this man produced a wholesome effect upon the Indians yet lingering in this region. The largest portion removed immediately to the more distant wilderness, while the few who remained were passive and became in a degree useful laborers.



Log Cabin.

Digitized by Google

GEOGRAPHY.

With the increase of population, advancing with a force unknown on any other portion of the globe, the relations of the country to the early settlements required frequent changes for the ready administration of government, with regard both to public law and policy. About fifty-eight years after the first attempt to establish a colony on the shores of New Amsterdam, it became indispensable to create divisions and subdivisions of territory. Accordingly, on the first day of November, 1683, by a law of the colony, the following ten counties were organized, viz: Suffolk, Queens, Kings, Richmond, New-York, West Chester, Dutchess, Orange, Ulster, and Albany. Each western county embraced the territory of the wilderness to the limits of the State, and was circumscribed from time to time by the erection of new counties, the organization of which served to define the western, northern and southern bounds of the county, from which the new territory was taken, 1772.—The contests of England and France for power at home, and for the trade of this country, retarded for many years the opening and peopling of the forests, the battle fields of the contending European powers seemed for a time to be transferred to the new world, and for near a century restrained the associations of men to the neighborhood of the early settled villages and towns. The waters of the Mohawk had long been an easy route through the wilderness as far as Canajoharie, and tempted hardy, courageous men to make their homes near its banks. In 1772 it became expedient to extend to these advanced settlers the ready protection of law, and facility for the enjoyment of every constitutional right. To effect this a new county was erected, taken from Albany county, then called Tryon county, and afterwards known as Montgomery county, This occurred just prior to the revolutionary struggle, a period which paralysed for the time the advance of civilization beyond existing populous neighborhoods. Within a few years after the achievement of the freedom of the people, emigration once more flowed rapidly over western lands. In 1791 the new counties of Herkimer, Otsego, Tioga and Ontario, were taken from Montgomery; in 1798 Oneida and part of Chenango were also taken from Montgomery; in 1802 Genesee was set off from Ontario, and subsequently in 1821, Livingston and Monroe, and again in 1823, Yates was taken from Ontario. From Genesee was taken Allegany in 1806; Cattaraugus, Chautauque, and Niagara in 1808, and Orleans in 1824.

Digitized by Google

Other divisions have been made since the year 1824, but the foregoing exhibits the links or chain of organization direct from the waters of the Hudson to the Niagara river.

The direct chain of organization of the county of Seneca is from Albany, the original colony, from whence was derived Tryon, or Montgomery, in 1772; thence Herkimer, 1791; from Herkimer was derived Onondaga, in 1794. Cayuga was organized from Onondaga, in 1799, and Seneca was erected into a county in 1804, taken from Cayuga. The boundaries of the county as ordained by statute, are as follows:* "The county of Seneca shall contain all that part of this State, bounded on the north by the county of Wayne, on the east by the county of Cayuga, on the south by the county of Tompkins, and on the west by the west shore of the Seneca lake, and from the north end of said lake, by the pre-emption line as established by law." A description so vague and defective, without reference to a single determinate point, cannot be well comprehended, or determine the limits of any portion of territory. Difficulties had arisen between New-York and Massachusetts, in relation to the region of country lying west of the Seneca lake, a large portion of which was claimed by Massachusetts. These difficulties were happily adjusted in 1786, by concessions on both sides; New-York retained the jurisdiction, while Massachusetts secured the pre-emptive right to the soil, or the right to the fee of the territory upon giving to the Indians such compensation for removal as would satisfy them. In order to establish the eastern limit of "the right," thus conferred on Massachusetts, it was ordered that a line should be run due north from the *eighty-second mile stone*, on the north boundary of Pennsylvania to the British possessions in Canada. And it is this line which is designated as the western boundary of the northern part of the county of Seneca. It does not appear that any observations have been made to establish the true position of this line relatively to any meridian. Yet for the purposes of this survey calculations have been made, based upon observations said to be made at adjacent points, by which it appears that the pre-emption line is about one mile east of the meridian of Washington. The geographical limits of the county may be defined as extending from 42 deg. 33 min., to 43 deg. 1 min. of north latitude, and from 55 to 76 deg. west of London. The western shores are washed by the clear waters of Seneca lake, a distance of thirty-nine miles; and the eastern shores by the Cayuga lake, nearly the same distance.

When the county was organized in the year 1804, by an act passed on

* Revised Statutes, chap. 2, title 1, page 14, vol. 3, second edition.

Digitized by Google

the 24th of March, its extent and limits comprised the towns of Ovid, Romulus, Fayette, and Junius. The towns of Ovid and Romulus had been organized as parts of Ontario county, by the general sessions, pursuant to an act passed on the 27th of January, 1789. Fayette had been organized as part of Cayuga county, on the 4th of March, 1800, and taken from Romulus. It then bore the name of Washington. This name was changed to Fayette, by an act passed on the 6th of April, 1808. Junius was taken from the town of Washington, (Fayette,) and organized by an act passed on the 12th February, 1803.

Since the erection of the county, several towns have been created by a division of the older and larger towns. In the year 1817, Covert was taken from Ovid, and in 1826 Covert was divided, and the town of Lodi was derived from the western portion.

Junius was divided in the year 1829, giving rise to the towns of Tyre, Waterloo, and Seneca Falls, and again in 1830 a northern portion of Romulus was organized as the town of Varick.

The county now comprises ten towns; taking them in alphabetical order they are Covert, Fayette, Junius, Lodi, Ovid, Romulus, Seneca Falls, Tyre, Varick, and Waterloo. The whole county covers an area of 197,500 acres. The territory is apportioned to the several towns as follows:

1. To Covert,	19,200	6. To Romulus,	21,500
2. " Fayette,	33,850	7. " Seneca Falls,	14,550
3. " Junius,	16,500	8. " Tyre,	18,600
4. " Lodi,	20,600	9. " Varick,	19,500
5. " Ovid,	19,200	10. " Waterloo,	13,000

The surface of the county may be classified thus:

Improved farms and lands,	150,990 acres.
Unimproved lands,	46,510 "

The assessed value of the county is $5,222,790, and of the towns respectively as follows:

1. Covert,	$546,731	6. Romulus,	$497,432
2. Fayette,	1,048,238	7. Seneca Falls,	517,899
3. Junius,	364,131	8. Tyre,	317,787
4. Lodi,	476,681	9. Varick,	458,100
5. Ovid,	523,063	10. Waterloo,	462,728

The taxes imposed on this valuation, and on personal property, (which is estimated at $744,924,) annually for county, town, road, and school taxes, forms an aggregate of about $24,000.

To facilitate the administration of justice, it was found expedient, in the year 1822, to divide the county into two jury districts, the courts being

Digitized by Google

held alternately at the court house in Waterloo and in Ovid. The northern jury district comprizes the towns of Fayette, Waterloo, Seneca Falls, Junius, and Tyre. The number of grand jurors in this district is one hundred and seventy-two, of petit jurors five hundred and ninety-four.

The Southern district comprises Covert, Lodi, Ovid, Romulus and Varick, with one hundred and fifty-seven grand jurors, and seven hundred and sixteen petit jurors.

ROADS.—When the Indian trail or foot path led the hardy citizen into this county, and at a period so recent that, the man yet lives who trod those very paths before any road was made; the most valuable products of this region were, furs or peltry, which were transported on the backs of Indian men and women, to points where traders assembled.

Often would the tangled briars and underwood obstruct their progress, or the treacherous swamp and precipitous ravine compel them to traverse an extended circuit. Soon, however, the rich rewards of labor, applied to a soil full of the elements of fertility, taught the cultivator the necessity for unobstructed, easy and rapid means of communication with the more populous country and active markets of the sea-board.

The face of the county had been surveyed and for the most part laid out in lots of about one mile square, presenting division lines running north and south, and at right angles east and west; it was deemed advisable to adopt a system or net work of roads conforming to the lot lines, as most convenient, uniform and direct for all useful purposes; accordingly the roads are generally co-incident with the lines of town lots, presentiug parallel avenues through the length and breadth of the county, about one mile asunder.

By this uniform system every branch of industry is encouraged and promoted; economy is a necessary consequence; and the diminished cost of agricultural products, proves generally to be a profit to the farmer.

In the early spring of the year, when the frost leaves the soil, and in the autumn when the rains loosen it, the roads have been at times impassable, at other seasons they are firm and smooth, being kept in excellent repair under the existing regulations of the highway laws.

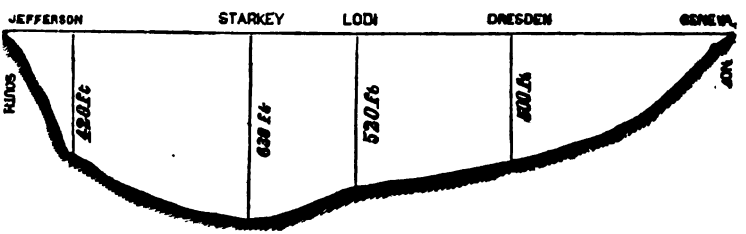
To avoid the delays and consumption of labor when frost and rains affect roads; the construction of a plank flooring has been adopted and has found general favor; private enterprize founded on the belief of emolument and public utility, has entered upon the formation of plank roads; several are in progress from the thriving village of Waterloo, extending north into Wayne co., south and toward Ovid, other similar roads branch off from the manufacturing village of Seneca Falls, and more recently a plank road has been laid along the

Digitized by Google

shore of Seneca lake from Geneva, across the outlet, passing through Rose Hill, it reaches the border of Varick. The beauty of the lake, the scenery of its shores, its bright transparent waters, its banks clothed with the richest verdure, and studded with edifices replete with comfort; their inmates given to hospitality; these advantages offer to the stranger and visitor one of the most agreeable rides, and enchanting scenes of which the nation can boast.

The lines of the Albany and Buffalo railroad, and a branch of the Erie canal passing through the northern towns; the navigable lakes bounding either side of the county; the New-York and Erie railroad in direct connection with Seneca lake, the Ithaca and Owego road in communication with the Cayuga lake; all present constant and direct communications with New-York and Boston, and every intermediate market on the Atlantic coast, and also with the great northern and western lakes and country. There is a remarkable feature, characteristic of Seneca lake, which is of inestimable value to the region round about; this lake maintains a temperature through the winter months, which prevents the accumulation of ice, and affords a permanent, available channel of intercourse with the north and south, and direct communication between New-York and Buffalo, in sixteen to twenty hours.

This peculiarity of temperature is explained in the chapter on springs. The formation of the bottom of the lake is given in the annexed diagram and the depth of water at the points indicated.



It will be perceived that the greatest depth is off Starkey's point and measures 630 feet below the surface. The surface of its waters is 431 feet above Albany, 447 feet above the ocean, and 216 feet above lake Ontario. The greatest depth is 183 feet below the surface of the ocean. According to a series of observations, the mean temperature of the lake, near its surface and for twelve months was $53\frac{91}{100}$°. At the depth of 80 feet it is about 48°. The lowest mean temperature was in the month of February, being then 34°, the highest in August, when it was 76°. Neither shoals nor bars oppose the navigation of this lake. At is northern extremity the waters have encroached upon the land, wearing the banks; their farther advance

Digitized by Google

is arrested by a sea wall erected by the State, to protect the canal which passes between the lake and the track of the railroad.

Seneca lake is thirty-nine miles in length, and about four miles wide, at its broadest point. The annexed sketch of the lake gives the position of the principal landing places, and the usual track of the steamboats is marked by the dotted line—the distance between each landing is as follows:

Geneva to Dresden,.....	14 miles.
Dresden to Baileytown or Ovid Landing,.....	5 do
Baileytown to Lodi Landing,.....	4 do
Lodi to Milo Landing,.....	5 do
Milo to Starkey and Dundee Landing,.....	3 do
Starkey to Big Stream Point,.....	4 do
Big Stream to Hector Falls,.....	8 do
Hector Falls to Jefferson Railroad Station,.....	3 do

The formation of the county does not admit the collection of waters on its surface in sufficient quantities to form rivers. Melting snows and the union of springs have caused waters to run for a season down the slopes of the elevated lands in the southern towns, forming precipices and ravines. The only perpetual stream in the county is the Seneca river—its waters are derived originally from the lake, and flowing in a direction about E. N. E., supply the various manufactories, mills, and machinery, with useful power at Waterloo; thence it flows on to Seneca Falls, where it is again applied to give force and motion to extensive machinery; from these falls it rolls on until it mingles with the waters of Cayuga lake, and running north, passes Montezuma; then stretching through the counties of Cayuga and Onondaga its waters join the Oswego river, falling into Lake Ontario at Oswego.

Big Creek is an unimportant stream, which receives a portion of the surface waters of Romulus, Varick, and Fayette, taking a northerly direction, parallel with the lakes, and about two miles east of Seneca lake, it falls into Seneca river at the farm of Mr. Jacob Kendig.

A rivulet of some importance and notoriety rises in the eastern part of Fayette, near the village of Canoga. The main supply issues from a pool, fifteen feet in diameter; the water is pure, leaving no sediment or deposit; pursuing its rapid course to Cayuga lake, giving power to several mills for grinding grain and sawing lumber. A curious feature of the pool is the quantity of nitrogen gas which escapes, at times giving to the water the appearance of ebullition. The spring is further noticed in the chapter on springs. This rivulet, and its locality obtains some notoriety from a tree, not far from its banks, under which the celebrated sachem Red

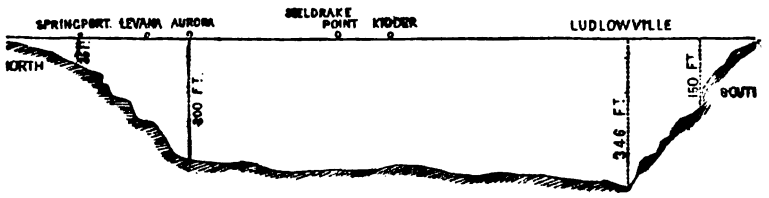
Digitized by Google

Jacket was born; a tree which he visited in his old age, with feelings alike honorable to his head and heart.

Lodi Creek is a stream fed from the high lands of the southern bounds of the county; when swollen with rains or melted snows, it sweeps down its shaly bed, bounding over the rapids until it reaches the farm and mills of Mr. Nicholl H. Wyckoff, where it pours over a precipice, falling into a basin about one hundred and sixty feet below. The steep and rocky sides of this glen are filled with objects of interest to the man of science, and to all who love a wild, rude scenery, clothed with verdure, ornamented with flowers of every tint, and checkered with light and shadow, as the sunbeams force their way through the dense and entangled foliage. Here and there, on the margin of this stream, are grist mills of admirable construction; their solid structure of stone, enough weather beaten to carry the marks of age, rising from groves of aged trees, might readily bring to mind the feeling of awe mingled with pleasure, which, in youthful days, would invest the lofty banks and frowning rocks with fairies, satyrs, and an elfin race: these twilight feelings, once so prevalent, are nearly blotted from the mind, by instruction and education; they have given place to thought, and reason, unceasingly occupied in objects of utility and the means of subsistence.

Cayuga lake, with its sparkling waters, washes gently the eastern shore of the county. This beautiful sheet of water is not so great in volume as Seneca lake, neither is the temperature of the water as high, which probably arises from a lesser depth of water, and the supply being derived from sources nearer to the surface of the earth than those which spring into the basin of the Seneca lake.

The annexed diagram exhibits the form of the Cayuga basin, in the direction of its length, with the depth of the water at the points indicated.



The depth of water off Springport is about twenty-five feet. At one mile south of this point, it is thirty-six feet deep; the water deepens rapidly, and between Aurora and the opposite western shore, the lead escaping the edge of the rock strata, sinks to a depth of near three hundred feet; the bluff edges of the rock frequently lead to error in sounding.

Digitized by Google

Off Sheldrake Point, on the Seneca shore, the water is shallow, the point jutting out far into the lake forms a narrow strip of earth of a texture seemingly tenacious or adhesive. A singular flexibility is attributed to the extreme portions of it, by the inhabitants of the neighborhood, who maintain that it shifts its position, curving to the northward or southward as the wind prevails from the one or the other direction. The deepest water of this lake is found near to Myers' Point, about four miles south of Himrod's Point, and toward the eastern shore. At this place the lead reaches the bottom at a depth of three hundred and ninety-six feet. The basin rises from this point rather abruptly, as will be seen by reference to the diagram.*

The surface of this lake freezes in the winter season, so far as to impede navigation occasionally. This basin, like that of Seneca lake, is probably supplied with water by the rain falling on the surface of the surrounding country, which, passing through the seams and fissures of the rocks, rushes into the basin below the surface of the lake. No streams of any magnitude flow into this lake; at Springport, a valuable flow of water gushes from the earth, giving power sufficient for machinery.

Both the Seneca and Cayuga lakes have abounded with the much esteemed white fish, weighing from five to ten pounds; numbers are taken annually to grace the tables of the wealthy and luxurious in the large cities. Trout are abundant; two varieties of bass fish are esteemed; and besides these, pike and perch abound, and eels of great size are numerous.

During the summer months the bosom of the Cayuga is studded here and there with the white canvass of sloops and schooners, engaged in transporting commodities from shore to shore, or from one extreme to its opposite. Steamboats of rare excellence divide the waters with their swift keels, hurrying the man of business or of pleasure from the great markets of the sea coast, to the cities and villages of the distant west, or carrying the merchant and trader of the west to the great centers of commerce, into which all nations now pour their fabrics and works of ingenuity and art.

Cayuga lake extends from north to south, about thirty-eight and a half miles. The traveller from Ithaca reaches Ludlowville, a distance of seven miles, and at two and a half miles farther north he passes Goodwin's Point: Kidder's Ferry, or Port Kidder, is seventeen and a quarter miles from Ithaca, and two miles south of Sheldrake Point; Aurora, one of the most beautiful villages in the State, is twenty-six miles from Ithaca; Levana is two miles farther north, and Springport is four and a half miles north of Levana. A few miles onward is the terminus of the Cayuga bridge, a

* The soundings of Cayuga lake are taken from Mr. Van Nuxem's Geological Report, and the traditions obtained from residents on its borders. Many persons assert that the depths of the Seneca and Cayuga lakes are far greater than is stated in this work.

Digitized by Google

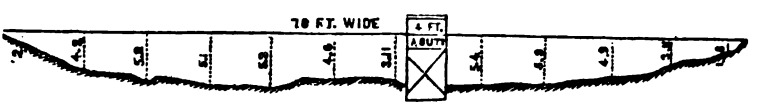
structure of vast importance in the early settlement of the country beyond Cayuga. In the year 1790, and until 1798, a ferry existed at this point; it was established by Col. John Harris, who relinquished his rights to an association, chartered for the purpose of erecting a bridge. It was completed and opened on the 4th of July, 1800; its length was one mile and ten rods, resting upon piles. In five years, decay rendered the bridge insecure, and in 1807 it fell into the lake. Speculative views interfered with the public good; chancery suits were invoked to protect supposed rights; the charter was forfeited; legislative relief restored all former rights, under due restrictions, and a new bridge was erected in 1812–13, at a cost of $44,000. This structure yielded to the effects of weather, storms and tempests, in 1833, giving place to the bridge now spanning the lake. The existing bridge cost about $16,000, and it is to be regretted that though now in good repair, and deemed secure, yet within the last year or two it has at times been impassable, giving presage of early destruction.

It has been remarked that no streams of any magnitude flow into either the Seneca or Cayuga lakes; yet the discharge from Seneca lake, giving rise to the Seneca river, is so great as to arrest attention, and to suggest frequently the inquiry, whence is this great body of water derived?

The surface of Crooked lake is 271 feet above the Seneca lake waters. The flow from Crooked lake empties through the outlet near Dresden; this outlet presents the form or figure shown in the following diagram:

The velocity of the current through this outlet is 132 feet per minute, which is equal to one and a half miles per hour. The quantity of water discharged is 144,065 gallons per minute. The volume of water discharged from Seneca lake into the river is equal to 232,806 gallons per minute.

The difference proving that 88,241 gallons per minute must be contributed by springs.* The form and dimensions of the outlet of Seneca lake are given in the following diagram:



* The waters received into the lake, from the Chemung canal, are not included in the estimates of quantities—supposing them to be balanced by the discharge at Geneva, through the Cayuga and Seneca canal.

Digitized by Google

The span of the bridge over the outlet is eighty-two feet; the western side is choked with sand, reducing the water course to seventy-two feet.

The percolation of rain through the slaty formation of this region has been considered under the head of springs, and needs no further illustration here, except to add that columns of water are known to rise from the bottom of the lake, with a force sufficient to cause a slight yet perceptible elevation on its placid surface; and when bathers have passed through these ascending columns, the cold has benumbed their limbs, warning them that danger attends a repeated experiment.

Waste Lands.

There is a feature which mars the general beauty of the northeastern town of this county, and its continued existence is strangely inconsistent with the energy and forecast of the farmers of Tyre.

Not less than six thousand acres of land are useless in the town of Tyre. They are worse than useless, for disease and decay have their haunts and fastnesses in that unfrequented place, dragging their slimy lengths along the miry channels, and with unwholesome breath they bid defiance to the boldest pioneer. The adjoining counties of Wayne and Cayuga are alike and equally interested in the removal of this pest, and it needs but a true presentation of the value of the wide area lying waste, to find and apply the remedy.

The soils of the northeastern lots of Tyre are, for many months of the year, overflowed by the waters from the Canandaigua, Seneca, and Cayuga lakes, all pressing along the margin of Seneca river, without finding a sufficient outlet for their discharge. For a period unknown, vegetable remains have been collected in strata, now measuring many feet in depth. From year to year this deposit increases, and is generally saturated with water, even in the driest season it offers a treacherous support to the foot. The soil is black, changing to a brown color when dried by heat. The underlying earthy surface is a marl, rich in carbonate of lime. The moisture which surrounds every fibre of the vegetable mass, contains an acid, and as the subsoil is calcareous, the acid tends to decompose the iron which is naturally present in marshes or bogs, (sulphate of iron,) and causes the production of sulphate of lime. This is not mentioned as uniformly, but as frequently occurring, and as one of the causes of unusual crops of corn, where the planter has previously composted this marsh mud and then applied it as a top-dressing to his corn hills, deriving signal advantage by rapid growth and large products.

Many have indulged the vain hope of reclaiming these marshes by individual exertion, without a general and thorough drainage. Such attempts

Digitized by Google

are useless, and will ever produce loss to the sanguine farmer. Vegetation cannot be perfectly developed in a soil merely vegetable, and rendered noxious to cultivated plants by its poisonous acid; the soil must first be altered by the art of man.

The extensive area of waste lands in Tyre, and the submerged lands adjoining, must at an early day claim attention, and be brought to a condition which shall add wealth and power to the counties in which they lie. There is no reason to doubt the easy accomplishment of this object. The face of the country, the fall and course of Seneca river, indicate the method by which to drain the basin retaining the vast amount of waters; which being done, it will rest with the skill of the farmer to furnish the vegetable soil with such other elements as will promote and support vigorous life in the various useful and profitable farm products. The underlying marls, with the neighboring lime kilns of Fayette and Seneca Falls, with the accustomed industry of the farmers, would in a few years make the present marshes to yield abundant and remunerating crops.

Thorough drainage must precede any attempt at cultivation, it must be complete, taking off all water from the entire mass of vegetable deposit, thereby allowing it to become firm, solid, and ready for the art of the husbandman.

In the town of Varick, nearly eight hundred acres of surface have been permitted to lie waste, and at times throw off the seeds of disease upon the surrounding farms. This swamp or bog is usually known as the "Cranberry swamp." The underlying slate rock forms a basin of no great depth, into which a vegetable deposit has fallen and accumulated. This basin sheds its surplus waters, by openings on its eastern margin into the Cayuga lake. Resting upon elevated ground, the town of Varick suffers much from this collection of water, and but for this drawback, Varick would in all respects be equal to the most fertile districts.

There is no apparent impediment to the easy reclamation of this cranberry swamp, the expense of which would be well repaid in a very few years by the ample products of its now useless area.

With the foregoing exceptions, there is no waste land in this county. The increasing value of all well cultivated fields in the vicinity of these swamps, will necessarily draw attention to the subject, and will produce probably a combined action or effort of the several contiguous counties, to reclaim an area of an extent so great, and composed of materials so useful as to present objects for reasonable profit unattended by delay.

Digitized by Google

INDUSTRIAL PURSUITS.

In the United States, freedom and security are enjoyed to an extent unknown in other nations; and it seems as if one element of happiness alone remains incomplete, causing a diversity of condition among the people; it is the degree of plenty in its broad signification, which varies the quantum of enjoyment of individuals.

The condition of man upon this globe does not, however, admit of equal degrees of plenty, and a few remarks upon the distribution of happiness or the possession of plenty among the various classes may be acceptable and gratifying to the farmer.

Subsistence is derived originally and solely from the soil; all food is produced from the soil. The possessors of the soil, therefore, control the great and principal element of happiness; and it is the excess of their production, beyond their wants, which warms into existence other occupations than husbandry, and encourages other talent to be exerted for the production of objects of ingenuity, comfort or luxury, which may be given in exchange for the farmers surplus products.

It is evident that by this arrangement the farmer is excited to increase his products from year to year that he may indulge in more varied comforts or gratify a taste for ornament and luxury, which growing habits soon erect into necessaries of life: those persons who from disinclination or other disability do not or cannot possess a portion of the soil are thus, also called into action, and receive, directly or indirectly from the cultivator of the ground, the necessaries of life or means for subsistence, giving for them what the farmer thinks he stands in need of: or like the merchant, the means for his subsistence may be derived, in the form of compensation for his exertions and labor in the distribution of surplus products.

Thus it is that artificial desires have acted as stimulants to industry and long continued habit has now established a wholesome mutual dependence of all classes upon each other, and the degree of plenty is governed by the greater industry and better talent that may be used or exerted. The artificial desires appertaining to this age are strongly illustrated by the fact that, multitudes of men obtain their subsistence by distributing objects which in themselves are useless, or positively injurious, for instance, tobacco is an article unfit for the preservation or continuance of life in any degree, and has no claim upon man for its use, other than is derived from fashion, idle indulgence, or a vitiated appetite. Yet this article gives a powerful impetus to

Digitized by Google

productive and distributive industry, as appears from the public documents of 1850; in which it is shown that an amount of tobacco has been exported from the United States in the year ending on the 30th of June, valued at more than nine and a half millions of dollars. Multitudes of other articles equally useless or non-essential, make up a large portion of trade and commerce, and may be ranked under the same class of stimuli founded chiefly on the habits of the farmer. Here let it be remembered that the farming population of the United States amount in number to 17,500,000 while the remainder of the population divided into many classes and vocations, are in number only 5,500,000.

The inquiring farmer will not fail to observe that though his own indulgence must have been the first active cause for this condition of life, he is now the recipient of the largest share of advantages springing from it. The advance of knowledge brought with it new and refined tastes; new habits were formed as new luxuries were introduced, and these habits have given additional life and vigor to that portion of the community who subsist by employments, which gratify the inclinations, the caprices, the wants real and imaginary, of the producers from the soil.

The farmer must see also, that the greater the demand is for these objects, so much greater will be the demand upon his farm for the supply of subsistence for the class of non-producers, and as a farm will always produce, with due care and attention, more than the proprietor and his family can possibly consume, so, he becomes necessarily richer by the stimulus which induces larger products, and may justly indulge the very gratifying reflection that, though industry is equally excited among all classes of people, yet Agriculture is the main supporting pillar of the fabric of society.

Agriculture being the direct source of human sustenance, all who are engaged in the distribution of its products, are instrumental in its promotion, and the whole vast machinery of trade and commerce has no intrinsic value beyond the accomplishment of this end.

Though this position as regards trade and commerce is strictly true, yet it must be remembered, that they confer upon the farmer benefits of inestimable value, it is the vast machine and depot, whereby the earth's products are transmitted to the consumers, or held in readiness for their use, without the continued labor or care of the farmer; and their values are returned to his door in any form or substance most desirable to him; it is a system of the division of labor, which in all its branches serves to promote the interests of the owner of the soil.

The condition of this county sixty years ago, when the surface was first subjected to imperfect tillage; the increase of inhabitants, the more recent

Digitized by Google

establishment of villages, the great demand for mechanical improvements followed by the introduction of almost every foreign luxury, strongly illustrate the foregoing positions.

In the year 1789—90, the first seed was scattered upon the earth of Senaca county; in a few short years, rudely constructed arks were seen floating on the lakes, or down the waters of the Susquehannah, loaded with the surplus products of the farmer. During the earlier period every want was supplied from the soil; food was derived from the grain and cattle, raiment from the wool of sheep; labor afforded neither time or desire for unnecesary objects. Soon, however, the earth presented to industry a greater amount of products than could be consumed or conveniently preserved; then the broadcloths of other nations began to supplant the homespun fabrics; the gown of India's cotton with gay color and strange sounding names, displaced the handiwork of the domestic spinning wheel and loom; with these comfortable innovations came also foreign teas and sugars.

When population had increased in New England to an extent, which could not be as cheaply sustained from the rocky soil, as from more fertile land, the people naturally sought other modes of subsistence than the cultivation of an unprofitable farm. Many left their homes to people and cultivate the western lands, while others applied themselves to vie with foreign nations in the manufacture of fabrics useful or tempting to the producing classes; a competion as bold as it has now become successful. In the early struggles of the manufacturing interests every avenue was industriously explored for markets, wherein to vend their fabrics; eastern industry and ingenuity again stimulated the agricultural people, and this county with others poured forth their grain and flour, their beeves and sheep, taking in return objects of industry, ingenuity and utility.

The impetus thus given was necessarily extended to the mechanic arts, to the greater use of metals and machinery, causing persons thus occupied to assemble and reside in villages, for greater convenience and mutual aid, in many cases selecting the rapids of rivers for the position of a village, that the power of water might be economically used. Thus Seneca Falls and Waterloo reared their heads; Canoga and Bearytown, Romulusville and Ovid, Lodi and Covert, Townsendville and Farmerville, became the busy residences of numbers not connected with the soil as farmers, yet all called into action for the aid of the cultivator, by employing their talents and industry, in consumption, distribution, and the production of commodities useful or convenient.

These and similar causes have, in the space of sixty years, made the wild forests within the bounds of this county to produce about 600,000

Digitized by Google

bushels of wheat, 350,000 bushels of oats, and 300,000 bushels of corn, per annum, with a due proportion of other agricultural products.

The following pages exhibit the productions of each town, in a manner at once simple yet showing at a glance the comparative condition of each town in regard to every article of production, also the total or aggregate quantities produced in the county.

The industrial pursuits are classified alphabetically, and so arranged as to show the capital, number of men, and the value of the commodities produced in each town, and forms an easy contrast of the towns. It may be noticed that the county contains 2,349 farms of various dimensions, and that the officers of the United States, employed to take the census of this county, have visited only 1,557 farms; consequently, the number of inhabitants, and quantity of products of this county, are much larger than is stated in the official returns.

It is due to the gentlemen engaged in taking the census of this county, to remark, that they were not required to visit or record farms, the income of which did not amount to one hundred dollars per annum; neither of industrial pursuits which did not yield five hundred dollars annually.

This will explain the discrepancy between the area of the county, as returned by the United States officers, (168,067 acres,) and the area upon which the supervisors of the county adjust the annual taxes, (197,500 acres,) being a difference of about thirty thousand acres.

The omission to report the inhabitants, products, and industrial pursuits covering a space of thirty thousand acres, necessarily presents the county in a less favorable condition than is due to it; yet, the system being uniform throughout the United States, the census will present an important State document, for all purposes of comparison, sufficient for the statesman and legislator.

Digitized by Google

VIEW OF THE AGRICULTURAL PRODUCTS OF THE COUNTY OF SENECA.

	Covert.	Fayette.	Junius.	Lodi.	Ovid.	Romulus.	Seneca Falls.	Tyre.	Varick	Waterloo	Total.
Improved acres,	15,171	21,886	9,089	16,311	12,927	17,438	8,810	7,776	14,150	5,142	128,700 } 168,067
Unimproved acres,	4,040	6,343	3,040	4,516	4,097	5,057	2,485	3,698	4,384	1,707	39,367 }
Horses,	655	1,096	488	767	539	682	358	405	661	229	5,880
Cows,	700	1,001	521	775	585	650	427	477	651	259	6,046
Oxen,	148	101	90	125	124	150	69	56	72	55	990
Other cattle,	805	1,135	582	844	595	891	349	592	557	298	6,648
Sheep,	4,919	4,499	2,527	3,735	3,803	5,005	2,511	2,241	2,827	2,289	34,356
Swine,	1,159	2,761	1,246	1,023	708	1,017	1,000	1,044	1,081	484	11,523
Wheat,	65,913	112,847	27,023	75,937	63,409	60,951	27,394	22,669	61,931	11,296	529,370 bush.
Rye,	.....	1,834	150	201	.....	.....	263	55	80	1,245	3,828 do
Corn,	37,327	55,798	21,330	20,789	25,605	35,289	14,345	20,062	32,354	14,350	277,249 do
Oats,	34,065	50,069	18,861	32,009	31,804	57,419	27,066	18,446	40,374	8,552	318,365 do
Barley,	10,235	15,009	8,041	10,017	8,618	8,837	5,886	5,477	7,419	2,735	82,274 do
Buckwheat,	3,183	1,344	1,484	4,048	.....	.....	1,263	2,211	.....	1,174	14,707 do
Flax seed,	98	135	19	100	65	580	.....	.....	489	.....	1,486 do
Clover seed,	846	1,419	251	538	872	1,089	510	462	941	101	7,029 do
Other grass seed,	164	738	65	386	227	655	256	56	469	50	3,066 do
Hay,	3,496	5,440	2,062	3,631	2,693	3,454	2,654	2,448	2,612	1,470	29,960 tons.
Peas and Beans,	215	201	92	153	4	1	198	58	47	114	1,083 bush.
Potatoes,	7,095	8,626	13,248	7,637	5,474	3,799	4,915	10,866	3,554	14,645	79,859 do
Butter,	59,710	91,729	43,705	63,320	51,785	56,765	36,650	43,705	56,160	18,445	521,974 lbs.
Cheese,	1,780	958	5,285	1,274	980	168	2,485	2,450	2,565	1,720	19,665 do
Wool,	17,853	14,528	8,070	15,687	12,282	16,593	8,924	7,338	10,816	6,778	118,869 do
Maple sugar,	6,006	.....	700	3,378	1,535	.....	.....	240	120	.....	11,979 do
Honey and Wax,	4,283	1,907	1,131	3,264	1,670	1,721	850	450	1,920	760	17,956 do
Domestic fabrics, value,	910	806	273	894	219	259	183	355	579	110	$4,588
Value of animals slaughtered,	$13,517	24,074	10,612	12,826	12,065	12,443	9,333	9,571	10,693	6,582	$121,716
Farms visited, giving foregoing results,	$204	247	109	201	162	185	93	114	185	57	1,557
Number of farms containing 26 acres and upwards, as per assessment rolls,	184	319	161	190	152	190	125	156	186	122	1,785
No. inhabitants per census return, 1850,	2,256	3,784	1,517	2,276	2,258	2,040	4,297	1,356	1,872	3,797	25,453
Value of Real Estate,	1,212,435	1,455,134	529,558	1,221,055	1,204,876	1,160,828	898,026	459,196	1,069,928	534,907	$9,745,943

Digitized by Google

VIEW OF THE INDUSTRIAL PURSUITS OF THE COUNTY OF SENECA, ARRANGED ALPHABETICALLY.

TAKEN FROM THE CENSUS OF THE UNITED STATES, 1850.

	Covert.	Fayette.	Junius.	Lodi.	Ovid.	Romulus.	Seneca Falls.	Tyre.	Varick.	Waterloo.	AGGREGATE OF No.	Capital.	Products.
Bakers,							1			1	2		
Capital employed,							300			4,500		4,800	
Men employed,													
Value of products,							2,870			8,240			11,110
Blacksmiths,	7	5	3	4	8	9	4	2	2		44		
Capital,	1,425	1,700	900	1,075	2,875	2,000	4,000	800	275			15,050	
Men,	10	10	5	6	12	13	13	4	2		75		
Value of products,	6,025	7,500	2,500	3,775	5,642	6,258	8,300	2,000	1,144				43,144
Blind and Sash makers,							2				2		
Capital,							10,650					10,650	
Men,							15				15		
Value of products,							11,600						11,600
Brush makers,	1										1		
Capital,	100											100	
Men,	5										5		
Value of property,	2,000												2,000
Cabinet makers,	1			1	1		4			1	8		
Capital,	100			500	150		3,300			1,700		5,750	
Persons employed,	1			1	1		8			4	15		
Value of products,	700			500	600		4,300			4,000			10,100
Carriage makers,	2	3		4	3	2	1	1	3		19		
Capital,	2,200	3,400		2,900	800	600	800	800	3,080			14,580	
Persons employed,	9	11		9	6	4	3	2	17		61		
Value of products,	6,960	5,800		4,950	2,717	1,635	1,500	600	7,637				31,799
Chair makers,										1	1		
Capital,										1,200		1,200	
Persons employed,										2	2		
Value of products,										925			925
Coopers,	1			3	1		2		2		9		
Capital,	150			400	500		1,750		300			3,100	
Persons employed,	1			3	2		15		2		23		
Value of products,	200			1,550	750		8,607		1,060				12,167

Digitized by Google

TABLE—(CONTINUED.)

	Covert.	Fayette.	Junius.	Lodi.	Ovid.	Romulus.	Seneca Falls.	Tyre.	Varick	Waterloo.	AGGREGATE OF No.	Capital.	Products.
Cotton factory,										1	1		
Capital,										40,000		40,000	
Persons employed,										48	48		
Value of products,										37,200			37,200
Cradle makers, (grain,)	1										1		
Capital,	200											200	
Persons employed,	2										2		
Value of products,	700												700
Cultivator teeth,							1				1		
Capital,							1,000					1,000	
Persons employed,							1				1		
Value of products,							700						700
Distilleries,							1			2	3		
Capital,							15,000			47,000		62,000	
Persons employed,										22	22		
Value of Products,							12,500			112,000			124,500
Drain Tiles and Pipes,										1	1		
Capital,										3,000		3,000	
Persons employed,										8	8		
Value of products,										3,100			3,100
Fork and Hoe factory,							1				1		
Capital,							2,250					2,250	
Persons employed,													
Value of products,							1,970						1,970
Founderies and Furnaces,	2				1		3			2	8		
Capital,	6,000				3,600		63,000			13,000		85,600	
Persons employed,	10				3		34			10	57		
Value of products,	7,700				1,896		45,000			14,000			68,596
Grist Mills,	1	5		4	3		8		1	1	23		
Capital,	7,000	50,000		10,500	25,000		159,000		7,000	12,000		270,500	
Persons employed,	3	12		8	9		32		2	1	67		
Bushels of Grain used,	15,000	104,000		17,000	61,000		319,000		41,000	17,000			

Digitized by Google

Barrels of Flour,	900	22,000		4,000	15,700		84,975		9,000	4,000			
Value of products,	6,500	113,500		21,000	91,550		453,290		45,000	20,370			751,210
Harness and Saddle makers,	3	2		2	3	1	3			1	15		
Capital,	1,100	3,300		1,200	410	350	2,450			1,700		10,510	
Persons employed,	5	5		4	5	1	13			3	36		
Value of products,	3,350	2,800		1,780	2,545	500	13,200			2,300			26,475
Lime kilns,	1										1		
Capital,	200											200	
Persons employed,	2										2		
Value of products,	750												750
Machinists,	1	1			2		1		1	1	7		
Capital,	1,500	5,000			3,750		7,000		8,300	1,000		26,500	
Persons employed,	4	10			6		10		1	2	33		
Value of products,	1,800	10,000			4,620		10,000		7,000	1,000			34,420
Oil mills,										2	2		
Capital,										11,000		11,000	
Persons employed,										4	4		
Value of products,										15,000			15,000
Paper makers,							1				1		
Capital,							8,000					8,000	
Persons employed,													
Value of products,							1,800						1,800
Plaster mills,	1						1			1	3		
Capital,	1,500						7,000			1,500		10,000	
Persons employed,	1						3			1	5		
Value of products,	800						7,500			780			9,080
Pump makers,	1						3				4		
Capital,	300						54,000					54,300	
Persons employed,	1						84				85		
Value of products,	900						93,362						94,262
Saw mills,	6	3			3	3	2		4	1	22		
Capital,	7,300	7,500					8,500					23,300	
Persons employed,	9	7			3	3	8		6		36		
Value of products,	6,400	8,400			1,700	4,750			7,790				29,040
Shoemakers,	8	4		4	3	3	3		1	2	28		
Capital,	2,050	750		1,050	550	800	3,000		150	9,800		18,150	
Persons employed,	13	7		6	9	5	19		3	14	76		
Value of products,	7,910	3,500		3,770	5,350	5,340	13,000		1,600	9,500			49,970
Soap and Candle makers,										1	1		
Capital,										10,000		10,000	
Persons employed,										3	3		
Value of products,										5,500			5,500

Digitized by Google

TABLE—(CONTINUED.)

	Covert.	Fayette.	Junius.	Lodi.	Ovid.	Romulus.	Seneca Falls.	Tyre.	Varick	Waterloo	AGGREGATE OF No.	Capital.	Products.
Stone quarries,	4			1							5		
Capital,	4,000			500								4,500	
Persons employed,	9			1							10		
Value of products,	4,550			450									5,000
Stove factories,							1				1		
Capital,							20,000					20,000	
Persons employed,							5				5		
Value of products,							33,000						33,000
Tailors,	2				2		2		1	3	10		
Capital,	1,900				200		7,000		75	8,500		17,675	
Persons employed,	4				6		32		1	36	79		
Value of products,	4,500				3,110		27,200		900	19,250			54,960
Tanneries,	2	3		2	1	1	1			1	11		
Capital,	1,200	12,000		1,800	800	600	6,000			1,200		23,600	
Persons employed,	2	14		4	2	1	2			1	26		
Value of products,	1,650	1,600		1,550	1,500	1,800	2,000			1,800			26,300
Tin workers,	1									2	3		
Capital,	800									3,000		3,800	
Persons employed,	2									4	6		
Value of products,	1,050												3,050
Turners,										1	1		
Capital,										1,000		1,000	
Persons employed,										4	4		
Value of products,										2,000			2,000
Wheelwrights,	1										1		
Capital,	650											650	
Persons employed,	1										1		
Value of products,	475												475
Woollen factories,							1			1	2		
Capital,							74,850			150,000		224,850	
Persons employed,							100			200	300		
Value of products,							96,000			175,000			271,000

Digitized by Google

It will be noticed by the careful reader, that no return of the industrial occupations pursued in Junius or Tyre, has been made, yet the capital reported as invested appears to be $987,815, and the labor consumed in its conduct and management to be applied by about 1,353 individuals. It appears also from these returns, that the use of this capital with the materials, and the labor applied to it, produced in one year various products, the value of which was $1,772,903.

The farmer will find much to interest him in the examination of these statistics, every item of which has an influence on his well doing. Under the head of grist mills it will be seen that two hundred and seventy thousand five hundred dollars are applied as capital to this branch of industry. These mills are worked by sixty-seven persons; they grind, collectively, five hundred and seventy-four thousand bushels of grain, and send out as one of their products, one hundred and forty thousand five hundred and seventy-five barrels of flour. In this instance the consumption of wheat grain exceeds the whole wheat product of the county.

Another branch of industry bearing direct on the product of the farm, is the manufacture of wool. The capital invested in the employment is $224,000, giving occupation to three hundred persons, whose labor is chiefly employed in attendance upon machinery. This capital and labor consumes annually 325,000 pounds of wool, being a quantity more than double of the whole wool product of the county. It is by no means intended to infer from these facts, that the value of the farmers' wheat and wool are immediately influenced by the mills and factories within the county. They are unimportant in their effect upon the market value of the raw material, yet their beneficial influences are great, inasmuch as they draw together masses of capital, increase the number of consumers of the articles of sustenance, all of which are derived from the farm; and so long as they are managed with prudence, they are influential in the increase of population and accumulation of capital.

Men who live in villages, possessing intelligence and enterprise, soon discover these springs which act with force upon capitalists, and when the impetus is given, every action gives birth to a new want or exercise of industry. It must be remembered that these springs of industrial occupations with their influences, belong properly to and arise from the non-producing class of citizens; the results of their labors do not produce the necessaries of life, or the materials for subsistence. This is peculiarly the occupation of farmers; it is for them to furnish subsistence for mankind, while those engaged in industrial pursuits supply the great body of the

Digitized by Google

people with articles of comfort and luxury, and the enjoyment of high civilization flowing from the well directed application of science and art.

CLIMATE.

"Our planet has two envelopes, of which one, which is general—the atmosphere—is composed of an elastic fluid, and the other the sea, is only locally distributed, surrounding and therefore modifying the form of the land. These two envelopes of air and sea constitute a natural whole on which depends the difference of climate on the earth's surface, according to the relative extension of the aqueous and solid parts, the form and aspect of the land, and the direction and elevation of mountain chains."*

The influence of water upon climate must be great, when it is considered how much of the earth's surface is covered by it. The area of land to that of water of the whole globe is estimated as ten is to twenty-seven. On this hemisphere the area of water is much more extensive, and must therefore alter and modify the climate of every latitude from that of the eastern hemisphere.

The reactions of air, sea and land upon each other must be carefully studied, before all the influences of climate upon vegetation can be comprehended. It is only of late years that observations and facts have been classified so far as to justify conclusions. It is only of late years that the proportion of land and water has been ascertained, it being a fixed opinion of the middle ages that the waters of the globe were only a narrow sea, and the term "ocean stream," so common at that period, seemed to foster the delusion. He who nearly three centuries ago "unchained the ocean," shared in this belief, and to it may probably be attributed the discovery of this hemisphere.

The configuration of this continent tends to alter its climate from that of the old world. Almost surrounded by water within the tropics, its temperature is still farther reduced below that of corresponding latitudes in Europe and Asia. The masses of ice which annually break up and float south between Labrador and Iceland, passing along the eastern shores of the United States, influence and lower their temperature. And finally the atmospheric current, which in the polar regions descends from above and traverses south along the surface of the land, becomes chilled and deprived of its watery vapor, until by reaching the middle states it has attained a due degree of warmth and moisture. Before it reaches the temperate latitudes, it contributes sensibly to lower the temperature of the land over which it blows. Unrestrained by mountain chains running from east to

* Humboldt.

Digitized by Google

west, this wind has full influence on the northern and eastern states, and would retard vegetation in the State of New-York, as it does in Canada, were it not for those great masses of water, the great lakes, whose power of equalizing the atmospheric temperatures in all seasons is remarkable.

As they do not freeze to any great extent, they protect the soil in some degree by the formation of clouds, which prevent a too great radiation of heat from the earth's surface in winter, and too copious evaporation in summer.

As compared with the European quarter of the old world, the United States is a vast plain, a level country; the portion under cultivation or held for agricultural occupation being two-thirds of its whole surface; this estimate omits the recent accession of territory from Mexico. The ranges of the Rocky mountains and the lesser range of the Alleghany seem to have been upheaved to regulate among other important influences, the excesses of heat and cold, and effects of agitated atmosphere, and it may be, to offer to man, under new forms and during new eras, a resting place and shelter, as he is gradually driven from the polar and mediate regions toward the equatorial belt, there to find climates not unfriendly, and sufficient for him in his course of change.

The elevation of a farm, three hundred and fifty feet above the level of the ocean, is equal to a diminution of the average temperature of its soil, to the extent of one degree of the thermometer, with this fact in view it is easy to conceive the effect of elevation upon agricultural success. So likewise the difference of distance north from the tropical regions diminishes the average temperature in the proportion of one degree of the thermometer for every sixty miles, or for each degree of latitude.

It is well established that the ocean climate is equal and uniform, and exercises a powerful influence in equalizing the temperature of the soil along its borders, at all seasons.

In Seneca county the temperature of the air and soil is influenced by the waters of the lake region, and especially by the waters of Seneca lake, which never freeze. During the warm months of the year, the rays of the sun are consumed in evaporation of the lakes, while the soil absorbs and retains them, thus equalizing the temperature of the atmosphere especially in this lake bound county.

Wind and rain have an intimate connection with the temperature of the atmosphere. The winds sweeping from the ocean, bring with them an atmosphere loaded with moisture. The winds from the lakes are proportionately charged with water. A land breeze is relatively dry and brings with it the extreme of heat in summer, or of cold in winter.

Hence, the variableness of climate. The talent fostered in the navy and

Digitized by Google

merchant marine of the United States, has established a variety of meteorological data or facts proving these several positions; the records of observing men in the interior of the State, all tend to confirm the general laws of storms of wind and rain, as they have been established within the last thirty years, and their effects upon climate. From data thus obtained it is clear that the southerly winds coming from the Atlantic charged with vapour, meeting the cooler air of this temperate region, the humidity is condensed and falls in rain; such almost uniformly is the result of a southerly wind passing over the county of Seneca. Often times the westerly winds come charged with moisture from lake Erie, with like results though not so uniform in action.

Thus it is that rains are modified by winds and have an influence on climate. It is useful also to know the quantity of rain which falls upon this county, for evaporation from the earth's surface lowers the temperature of the atmosphere, while waters resting on the surface or in the soil lower the temperature of the earth and render it the longer unfit for the purposes of vegetation.* The quantity of water which falls from the atmosphere varies exceedingly at different localities, as will appear by the following statement: The annual average fall of rain within the tropics of the old world is 77 inches; during the same period, within the American tropics it is 115 inches. Near Bombay in Asia, the fall is equal to 25 feet! The quantity on temperate Europe gives a mean fall of 34 inches. On the United States a mean fall of 39 inches, and on Seneca county $31\frac{46}{100}$.

It is not necessary to discuss the question as to change of climate, it may be sufficient to state that, abundant proof exists of changes with the several epochs of the world; one manifest proof being, the discovery of the same vegetable type in every part of the coal formation in latitudes where the plant cannot now endure the climate. It has thus been shown that geographical position influences climate. The elevation of the earth or soil, mountains, seas and lakes, strongly characterise particular latitudes.

The importance of atmospheric influences is so striking that diagrams are presented with this work, exhibiting familiarly to the eye the sectional contour of the county of Seneca, with the heights of elevations and extent of plains and valleys. Diagrams are added also, exhibiting the mean temperature of the atmosphere for each day of the years 1849 and 1850, with the hope of attracting more general attention from the farmer to meteorology, a subject closely connected with his welfare; and the annexed table presents a comparative view of the climate as observed in Seneca county with other and prominent places in the State.

* See Drainage.

Digitized by Google

COMPARISON OF CLIMATE, AS OBSERVED AT DIFFERENT LOCALITIES.

LOCALITIES.	Latitude.		Elevation.	Mean temperature by observation.	FACTS OBSERVED.							
					Robins seen	Shad bush in bloom.	Currants in bloom.	Cherries in bloom.	Apples in bloom.	Hay harvest commenced	Wheat harvest commenced	First killing frost.
	deg.	min.										
Fayette, Seneca county,	42	50	460	48·38	12 March.	.....	.....	.....	.....	.....	.....	.....
Aurora, Cayuga county,	42	43	400	48·07	.....	29 April.	5 May.	17 May.	22 May.	.....	.....	11 Sept.
Palmyra, Wayne county,	43	5	450	46·55	1 March.	4 May.	4 May.	.....	12 May.	11 July.	.....	.....
Canandaigua, Ontario county,	42	50	540	46·01	19 March.	26 April.	4 May.	11 May.	15 May.	8 July.	.....	20 Sept.
Rochester,	43	8	506	46·50	17 March.	30 April.	4 May.	7 May.	12 May.	5 July.	.....	1 Oct.
Utica,	43	6	473	45·49	21 March.	.....	4 May.	1 May.	18 May.	4 July.	24 July.	22 Sept.
Schenectady,	42	48	200	46·48	29 March.	.....	1 May.	2 May.	12 May.	.....	.....	.....
Jamaica, L. I.,	40	41	100	49·43	11 March.	7 May.	9 May.	17 May.	24 May.	.....	23 July.	23 Oct.

Digitized by Google

The highest temperature of the atmosphere observed in this county for a period of five years, is 90°, and the lowest 2°. These are the limits of change of temperature, and the mean temperature is $49\frac{30}{100}$°. The elevation of Seneca lake is four hundred and forty-seven feet above the ocean, and the mean elevation of the soil of the county is two hundred and fifty feet. No observations have been recorded as to the temperature of the soil, nor have they been collected in any part of the State, so far as can be ascertained, except those made by Mr. Emmons, in Albany, and published in the Natural History of the State of New-York, at page 232. These observations were made by placing the bulb of the thermometer seven inches below the surface of the earth, and recorded early and late in the day.

During the month of		April,	the range was from	40 deg.	to.	58 deg.	
do	do	May,	do	40	do	64	do
(Only five days below 46.)							
During the month of		June,	the range was from	50	do	57	do
do	do	August,	do	64	do	68	do
do	do	September,	do	48	do	65	do
do	do	October,	do	33	do	51	do
do	do	November,	do	30	do	42	do

Until more extensive observations shall be recorded, no reliable laws in relation to the temperature of the soil can be offered. Sufficient information can be derived from Mr. Emmons' observations to guide the farmer, in connection with other established facts. Thus it is known that plants will germinate at a temperature between 45° and 100°. When, therefore, the mean temperature of the soil is at or below 45°, in the months of April and May, it is vain to expect germination, and a waste of labor and seed to hasten its deposit in the earth. Indian corn does not vegetate at a lower temperature than 55°, which accounts for the occasional disappointment of farmers, by the entire disappearance by decay of the seed.

The month of April in this year (1850,) affords an illustration of these facts. The mean temperature for the first twenty days of April was only $39\frac{20}{100}$°. For the last ten days of the month it was $53\frac{60}{100}$°, and for the entire thirty days it was 44°. The month of May opened cold, the mean temperature for the first ten days being $48\frac{30}{100}$°. The earth saturated with water presented a lower temperature to the seed deposited, and being at or below the degree needful for germination, much seed decayed, and many farmers who planted corn early were compelled to plant a second time, or forego a crop for the season.

It seems manifest therefore, that though every requisite for the full de-

Digitized by Google

velopment of plants be abundantly supplied, yet the absence of *heat* renders all the others inert. The barrenness of the polar and productiveness of the tropical regions, the suspension of vegetable life in winter, its return with the warmth of spring, prove the position. The horticulturist, aware of this truth, brings artificial heat to his aid, and by skill creates an artificial climate, and in a degree produces fruits, which the warmth of the sun yields naturally for the health and pleasure of man. In this case, however, as in most artificial conditions of life, the *forcing* system is injurious. It is not consistent with nature's laws; health is injured by the absence of repose. The fruit produced is rarely perfect or agreeable. Art triumphs for a few short seasons, when the exhausted plant dies.

Excess of heat has, during some seasons, been injurious to vegetation; for though plants possess the power of resisting heat by the evaporation of moisture, yet when the supply is deficient, as was the case in the summer of 1849, the dry atmosphere burns the plant, it contracts, withers and dies.

Excess of cold is also injurious; it has been shown that plants will not germinate in a temperature below 45°, yet vitality is not destroyed when seed is exposed to a much lower temperature. When, however, congelation takes place, expansion ensues, tearing and breaking open the vessels exposing them to the influences of the air, where alone fluids should exist. The juices are made to separate and become unable to perform their proper functions, and too often the rising plant is forcibly separated from its embryo seed, and both perish from cold. The grain fields of this region have occasionally and in former days, exhibited these effects of cold. Happily the system of drainage has diminished the evil.

The due and proper adaptation of plants to soils and climate, demands more attention than it has generally received; the attempts to introduce various grasses and foreign grains have in many instances proved abortive, from want of a due consideration of the effects of temperature. Plants may live and grow, seeds may vegetate in many localities; but to *flourish* to *mature* and develop sound fruit or products, a degree of heat within a certain range is essential. Chick-weed will live and bloom in heat and cold, presenting its blossoms every month in the year, but the nettle and thistle yield to the early frosts, nor will they vegetate until the strong rays of the sun call them into life.

Wheat will not germinate in an atmosphere higher than 95°; while Indian corn will endure a heat of 110°, and throw forth a healthy shoot; thus corn will thrive where wheat cannot be grown. These facts call for a careful consideration and adaptation of seeds to the climate; not only in rela-

Digitized by Google

tion to heat, but also in reference to elevation above the Ocean and distance from the equatorial regions.

Humboldt has forcibly displayed the effects of varied climates in describing the ascent of snow-capped mountains. At the base of Teneriffe; dates, plantain, sugar cane, and the noble ban yan flourish as in tropic heats. A litte higher, the vine, olive, fig, the orange and the lemon and other fruits and trees of southern Europe, grow in rich profusion; there also *wheat* and grasses thrive, with the apple, the cherry and the plum. Above this region is a belt of hardy wood, the oaks, the laurel and other evergreens. Next above is the region of firs with juniper, then a tract covered with heath or broom, above which are found the mosses, violets and a few grasses, creeping into the borders of the interminable snows which form the summit cap of the mountain.

The peculiar position of the county of Seneca must necessarily have a controlling influence upon the pursuits of the people; washed by lakes on the eastern and western borders for two-thirds of its entire length, the broad waters of Ontario not far distant from the northern boundary; it is not without interest for the farmer to be better acquainted with the causes of the increase or diminution of moisture in the atmosphere.

Within a few past years the thermometer has found its way into the dwellings of many farmers, giving a knowledge of the *temperature* of the atmosphere. More recently, the barometer has been introduced on several farms, indicating the weight or pressure of the air, giving notice of the approaching storm or the continuance of clear skies: the hygrometer which measures the condition of *moisture* in the atmosphere is less known. Yet it is an implement or instrument from which comfort may be derived, by showing that though no rain falls nor a cloud passes for days, yet there is no cause for apprehension of evil; for the atmosphere holds an amount of moisture which the leaves of plants are able to appropriate in sufficient quantity to sustain vigorous health.

With these instruments and a knowledge of the principles which govern their action, the farmer would learn to have more confidence in the unlimited goodness which surrounds him, gratitude would overflow, and aspirations would more frequently be poured forth, for the light of knowledge and the consequent increase of comfort and joy.

The following diagrams exhibit the daily mean temperature of the atmosphere for the years 1849 and 1850. The arrangement presents at once the condition and contrast of corresponding dates in each year. The observations were made at Oaklands, in the town of Fayette, the elevation being about 480 feet above tide water. These and like observations have been

Digitized by Google

recorded for a series of years, of which the two last are given as indicative of the temperature at the several seasons. They are given also with a belief that every careful, prudent farmer will derive a benefit from their examination, and find an inducement to seek information in relation to the subject of climate.

The importance of this branch of knowledge has occupied the attention of the Regents of the University, who are now engaged in establishing meteorological stations in different parts of this State, and it is understood that a station will be located at Geneva.

The principal object of these stations will be the ascertainment of the laws of storms, and the special climate of the State as regards temperature, humidity, &c. The benefits to general science will undoubtedly be great, and the agriculturist will assuredly derive a full share of advantage; yet farmers will act wisely if they continue their own observations and record them daily, for years will probably elapse before any decisive results can be obtained from the stations, or that the observed and recorded facts can be so digested and arranged as to offer any facts practically useful to the great body of the people.

Mean monthly temperature in the years 1849 *and* 1850, *at Oaklands,* (*Fayette,*) *county of Seneca.*

	1849.	1850.
January,	24·10	32·87
February,	24·85	30·52
March,	37·51	35·13
April,	31·36	44
May,	55	51·74
June,	68	68
July,	73	72·6
August,	68	69
September,	61	60·30
October,	48·59	49·97
November,	46·6	44·20
December,	29·50	28·39

Mean annual temperature of the year 1849—47¼ deg.

Mean annual temperature of the year 1850—48 $\frac{35}{100}$ deg.

The latitude of Oaklands is 42 deg. 52 min. 45 sec. Longitude, 2 deg. 30 min. east of Washington.

Digitized by Google

Meteorological records kept by Mr. John P. Fairchild, at Seneca Falls, the altitude being 463 feet above the ocean.

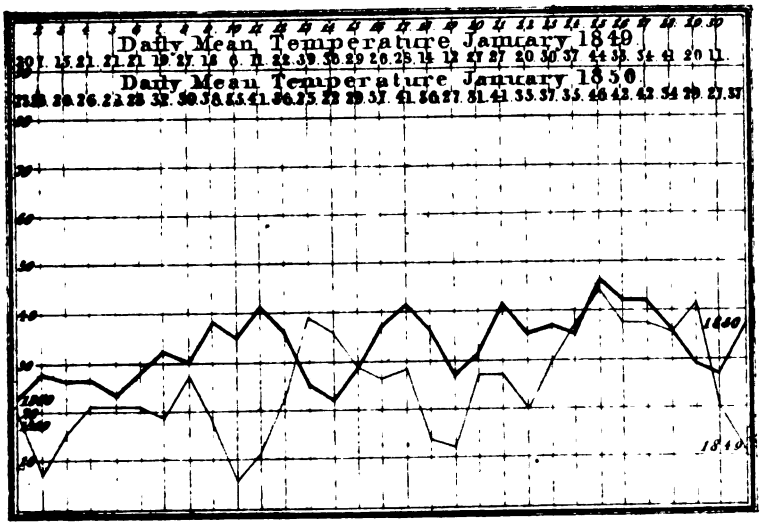
1850.	Monthly mean. deg.	Coldest at sunrise. deg.	Warmest at 3 P. M. deg.	Prevailing Wind—Days.								Rain guage. inches.
				N.	NE.	E.	SE.	S.	SW.	W.	NW.	
January,...	30·08	11	50	5	1	1	6	7	1	5	5	1·55
February,..	25·73	4	51	1	1	1	2	8	2	6	7	1·79
March, ...	31·60	7	53	2	0	2	2	1	0	13	11	2·66
April,.....	41·67	18	79	4	..	2	6	4	2	4	8	2·20
May, ...	50·56	30	79	1	..	2	2	2	3	13	8	2·61
June,.....	67·31	41	91	1	..	..	2	6	4	9	8	2·20
July,.....	71·04	48	89	2	3	1	7	5	1	4	8	5·15
August,....	67·26	46	86	1	..	..	9	2	1	7	11	3 73
September,.	58·37	35	83	1	1	..	9	4	2	8	5	4·50
October, ...	47·36	26	73	..	1	..	6	2	5	8	9	4·91
November,.	41·47	22	70	1	..	1	6	3	0	9	10	3·59
December,.	25·93	4	46	2	3	4	1	4	2	7	8	5·01
The year,...	46·78	.	..	21	10	14	58	48	23	93	98	40·10

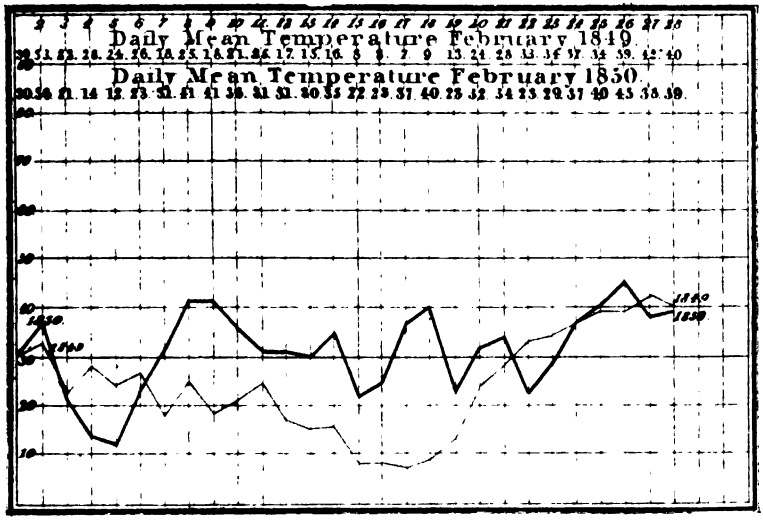
The observations were recorded daily at sunrise, at 9 A. M., at 3 P. M., and at 9 P. M.

The following table exhibits the mean annual temperature of the atmosphere and fall of rain at Penn Yan, for twenty-one years, and may be useful for future reference and comparison. The village is about seven miles west of the pre-emption line, in latitude 42 deg. 41 min., and west from the meridian of Washington about 4 min. 30 sec.

	Atmosphere.	Rain.
1829	47·88	32·39
1830	48·42	30·07
1831	45·58	29·90
1832	48·39	30·70
1833	48	25·89
1834	48·54	22·39
1835	46·40	26·51
1836	45·50	27·85
1837	46·08	24·56
1838	45·47	31·40
1839	46·12	31·30
1840	48·17	28·29
1841	46·57	24·04
1842	47·54	31·50
1843	45·34	29·18
1844	46	20·10
1845	45·92	24·40
1846	46·33	28·93

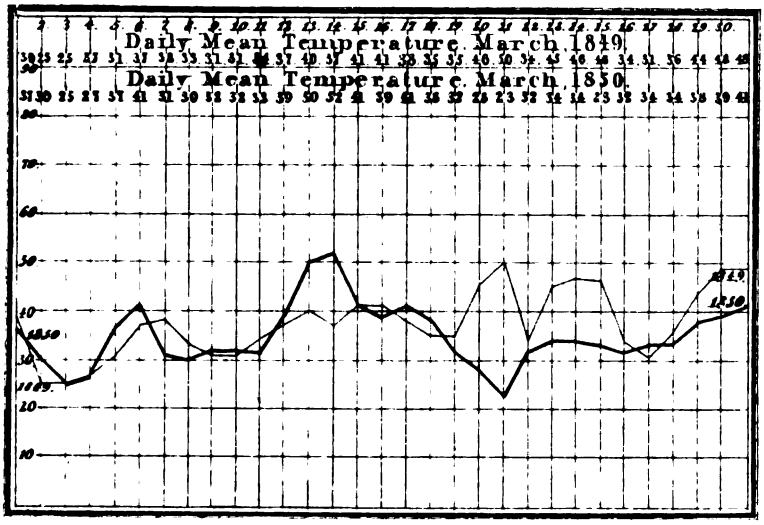
Digitized by Google

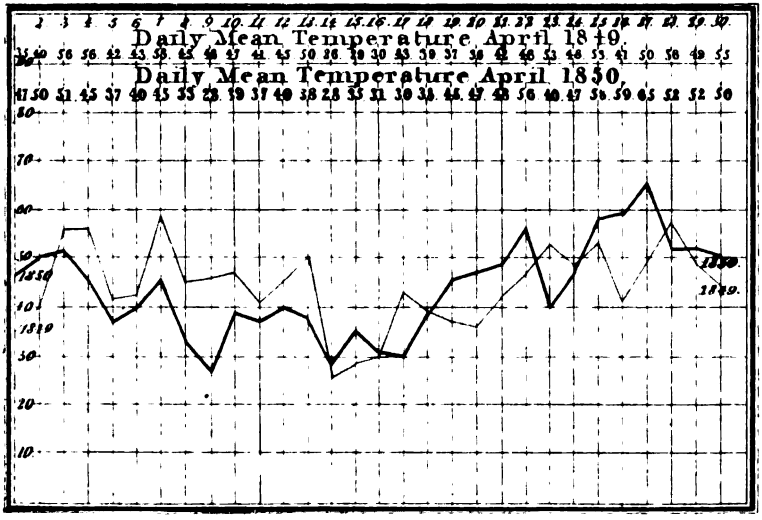




Digitized by Google

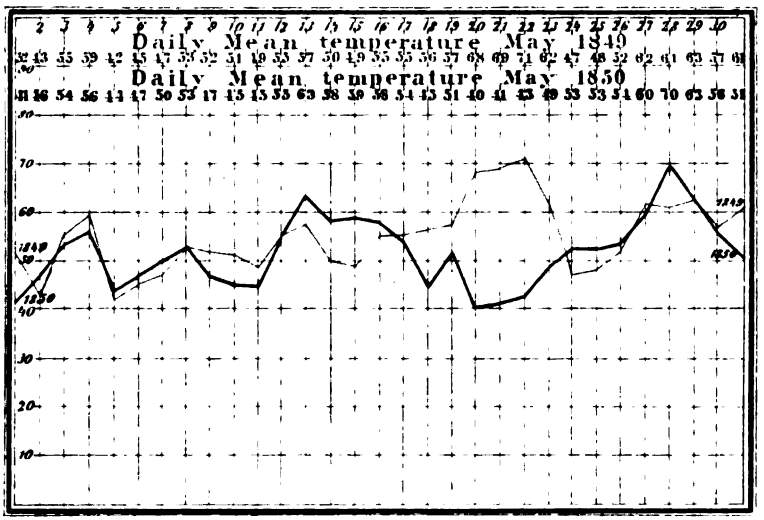
Digitized by Google

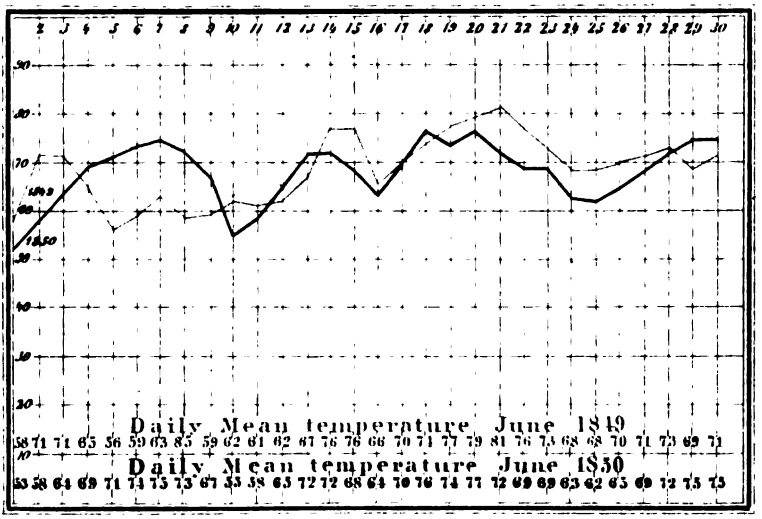




Digitized by Google

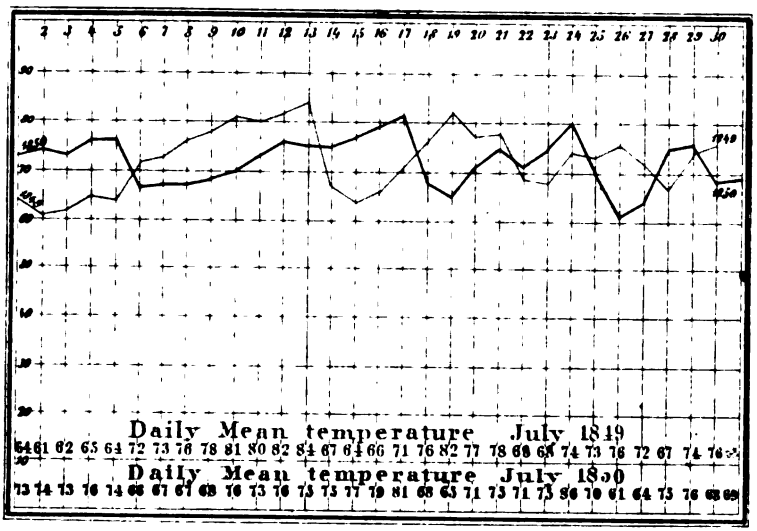
Digitized by Google

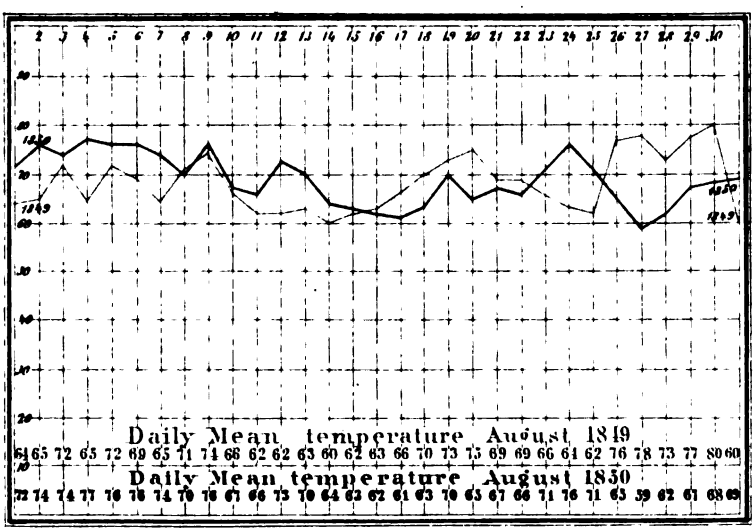




Digitized by Google

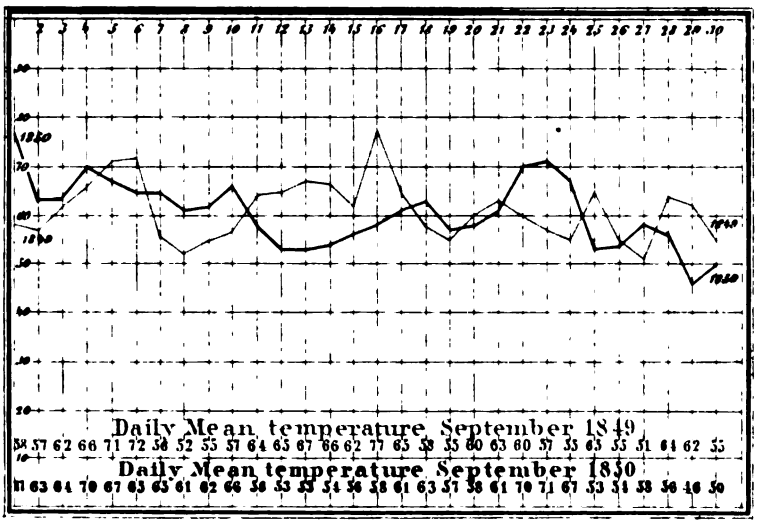
Digitized by Google

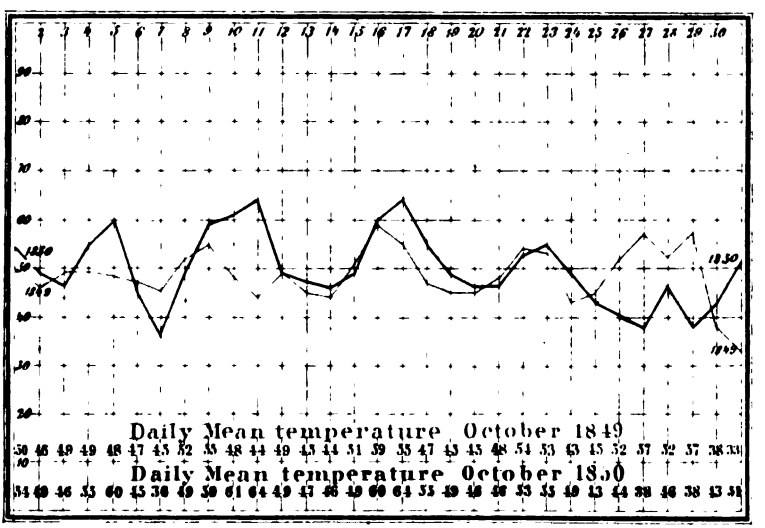




Digitized by Google

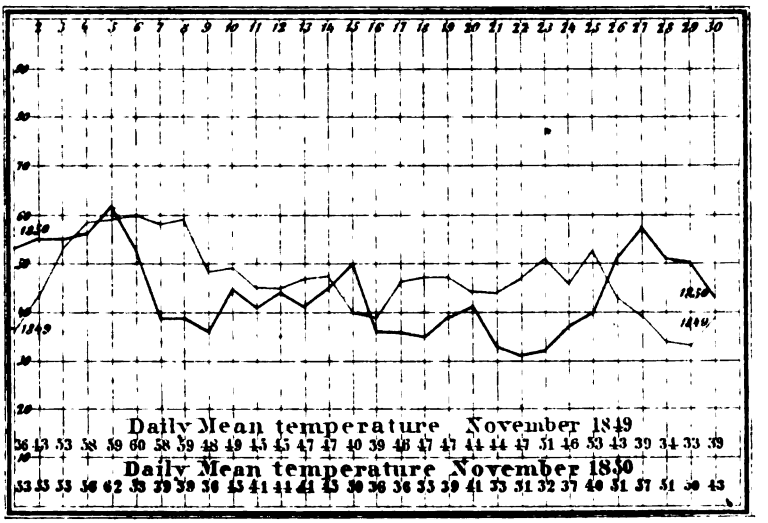
Digitized by Google

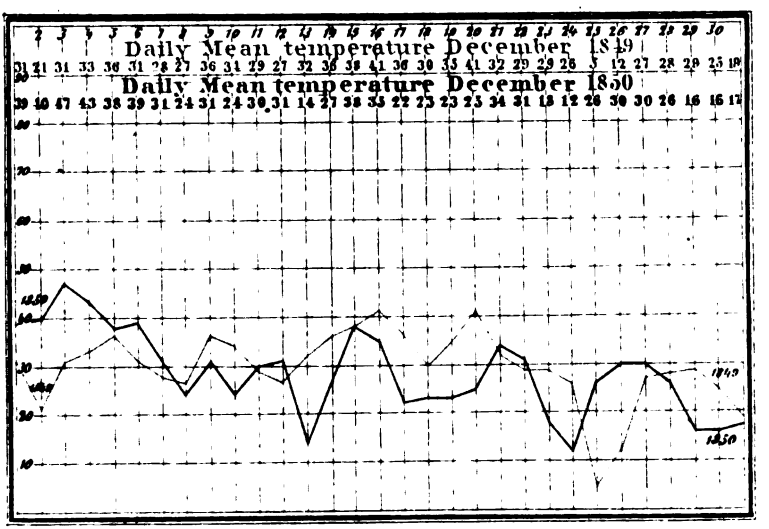




Digitized by Google

Digitized by Google





Digitized by Google

Digitized by Google

	Atmosphere.	Rain.
1847	45·44	27·72
1848	46·48	22·47
1849	45·46	22·97

NOTE.—This table is compiled from the records of Doctor H. P. Sartwell, of Penn Yan.

From this record it appears that the mean temperature for the period of twenty-one years, is 46·65 degrees, and the average depth of rain for the same time is 27·26 inches.

Penn Yan is about seven hundred and fifty feet above tide water.

Commencement of the Wheat Harvest in the County of Seneca, from the year 1822 *to* 1850.

1822,	commenced on	5th	July.	
1823,	do	8th	do	a wet season.
1824,	do	10th	do	
1825,	do	10th	do	
1826,	do	11th	do	
1827,	do	9th	do	a heavy crop.
1828,	do	16th	do	wheat much injured.
1829,	do	18th	do	a very good crop.
1830,	do	16th	do	a very heavy crop.
1831,	do	12th	do	injured by the Hessian fly.
1832,	do	17th	do	a good crop.
1833,	do	16th	do	a very large and heavy crop.
1834,	do	21st	do	much injured by rust.
1835,	do	24th	do	much injured by rust.
1836,	do	28th	do	a short crop, plant smothered by deep snow.
1837,	do	22d	do	much rust.
1838,	do	19th	do	the crop good—much lost by a hail storm.
1839,	do	14th	do	a fair crop.
1840,	do	16th	do	a good crop.
1841,	do	17th	do	a good crop.
1842,	do	19th	do	injured by hail, and a wet season.
1843,	do	19th	do	a great and heavy crop.
1844,	do	12th	do	injured by Hessian fly.
1845,	do	14th	do	a good crop.
1846,	do	7th	do	a good crop.
1847,	do	14th	do	a good crop.
1848,	do	6th	do	a very good crop.
1849,	do	14th	do	injured by wheat fly, and a dry season.
1850,	do	16th	do	an excellent crop.

Digitized by Google

GEOLOGY.

In a work which, like the present, is professedly an accumulation of statistics, and a declaration of facts, theoretical considerations might be deemed out of place, and likely, by biasing the mind, to derogate from the value of the statements made. There are, however, so many links of reasoning which bind apparently incongruous facts together, and serve to harmonize them as a whole, and which convert the mere documentary statistics into a methodical relation of cause and effect, rendering the mass of facts simple to comprehend and easy to recollect; that to withhold them would be to detract from the unity and completeness of the work.

Under this category are included considerations derived from inspections of the rocks distributed over the globe, the regularity of their position, with regard to each other, their textural appearance, their chemical constitution, and the various matters found imbedded within them, presenting such points of analogy, even when brought from the remotest parts of the globe, that the mind is led to the irresistible conclusion, that similar effects must have arisen from similar causes, and becomes curious to inquire what these causes were, and to what amount they have acted. Such information on these topics as have any bearing on the geology and agriculture of the county of Seneca, will be presented as clearly and succinctly as possible, leaving any further knowledge to be derived from the various surveys of the State, or other sources, as the inquirer may desire.

In passing along a district of country, as from the head waters of the Mississippi toward the eastern limit of the State of New-York, the observer may find the surface of the country a mass of clay, of perhaps in some cases unascertainable depth, in others being so slight a covering to the surface that the rock becomes exposed, and forms the prominent features of the district. It is in a valley or basin of this rock that the clay has rested, and in every instance it is possible, by boring, to come down upon the rock.

The kind of rock which may be met with varies considerably; sometimes it is a mass of white or red grains closely cemented together, and known as freestone, or sandstone, sometimes a slate, sometimes a limestone or chalk, or occasionally the harder rocks, known as mica slate, gneiss, or granite. Travelling over the district alluded to, after the thick and heavy clays of

Digitized by Google

the alluvial valley of the Mississippi is passed a tract of country is reached, overlaid by hills of sand, and ridges of gravel, with large blocks of stone covering the ground on every side, the rocks of the country here being to a great degree hidden by the deep accumulation of the soil. On the margin of Wisconsin river a bed of sandstone is found in situ, as the rock of the district; passing east into Michigan, limestone is found, including coal. Passing through west Canada, by the falls into New-York, red sand stone appears, with slate rock, limestone, flag stones, and gypsum, as far as Ithaca; thence southeast, the country becomes more elevated, and the scenery is bolder, rocks of a crystaline and glittering texture abound, including mica slate and hornblende, and finally hills of granite are reached in the Highlands on the Hudson river. These rocks met with on this line constitute almost all that are found on the globe, and usually occur in the order in which they have been enumerated on this continent; and if it were possible to bore downwards far into the earth, they would all be met with in the order mentioned, commencing at the surface as in the view from the west, and counting downwards until the granite was reached, which formation may be looked upon as the basic structure of our globe, on which all other rocks rest, and from which they are to a great extent derived.

Wherever granite is upon the surface, as a rock bed, there is no other rock below, and whatever rock may be above, it is possible to reach granite by boring downwards, and generally certain to come at it by travelling to the hilly country on either side. It constitutes the great elevations, dipping and rising in alternations, in the basins or hollows of which all other rocks are placed.

This granite rock is composed of three minerals mixed together in unequal proportions, quartz, felspar, and mica; each of these separately form rocks which derive their name from the mineral as quartz rock, mica and clay slate. When hornblende mineral replaces the mica, the granite is called syenite; other modifications of these minerals produce granite form rocks and minerals.

It is generally admitted that these rocks have undergone the influence of some heating agency until they were completely molten, when cooling slowly the minerals of which they were composed crystalized in their appropriate forms, and thus the glassy and hard structure was communicated to the rock. Volcanic upheavals raised the mass of granite, sometimes when it was in a semi-fluid condition, and more frequently after it was fully solidified, the elevating cause acting with such intensity as to raise this originally lowest placed, or primary rock, to the highest elevation which mountain tops attain to on this globe.

Digitized by Google

Covered by water as the greater portion of the earth's surface was, at that early period of the world's existence, those granitic hills, whose sides were subjected to the action of water, wind, solar heat, and frost, gradually became worn away, and the materials being disintegrated and carried down into the sea, were deposited along the ocean bottom in an even layer or bed. If the deposit had taken place in quiet waters, the minerals would have been arranged for the formation of gneiss rock; on the contrary, if an agitating or sifting took place, or the materials were carried very far out, they would have been deposited in different places, according to their gravity, just as clay is separated from sand by washing, and the result would have been a formation of mica slate, of finely powdered felspar rock, or of sandstone. When these beds of soft materials have been subjected to intense pressure from above, and long continued action of heat, and perhaps magnetic agency from below, they are ultimately converted into hard rock, and should they by volcanic movements be slowly raised from the ocean bed, they are presented to the eye as the striped gneiss, a mica slate rock, a clay slate, or a sandstone. Beds of stone, from their proximity to a rock once ignited, and in some degree affected by the internal temperature, lose their distinguishing character of water formed or stratified rocks, they have undergone a change whereby they are assimilated to granite formations, and hence have been called metamorphic. None of these rocks are found in this country as a rock in place; they are met with on the surface as travelled stones.

Taking a positition at the Highlands of the Hudson and looking to the west, the order is found to be, granite or primary rock, then mica and clay slate rocks; lying west of these, or upon the top of them in position, is a class of rocks, formed by deposition out of salt water, and containing traces of the animal and vegetable life of the period when they were formed, unaltered by any metamorphic action. In physical character they are sand stone rocks, both fine grained and conglomerated; more frequently composed of siliceous and argillaceous matter forming slates and flag stones. Limestone occurs in subordinate quantity with streaks of carbonaceous matter, or small isolated masses of coal, mostly anthracite, but never containing a true coal seam.

With these are associated beds of shale, the tints principally grey or brown, olive and green, and even red is here and there found in all parts of the series.

Inclosed among these beds in this country, occur the beds of plaster and salt of this State, The lower beds of this series merge gradually into the metamorphic clay slate, and the upper pass into the old red sand stone.

Digitized by Google

This class of rocks so largely developed in this State, and so important, are but thinly formed in western Europe, where they were formerly termed Greywaucke rocks, and in latter years, Cambrian, and silurian Systems, from the English localities where they are found most abundant.

Such a system of nomenclature is unfortunate, as conveying no information to one ignorant of the locality, and it is a matter of regret to see the analogous rocks of this State receive names derived from their locality, which require thus a new name in every State where they may be found to exist.

It is the most recently formed or higher portion of these rocks (the *silurian* series) that occupy the northern portion of the county of Seneca, and which are sub-divided by the authors of the geological survey of the State of New-York, into the Onondaga salt group, the water lime group, the Seneca limestone, the Marcellus shale, the Hamilton group and the Genesee black shale; it will be necessary to allude to these more fully hereafter.

After the formation of these rocks, there appears to have been a period of great repose, as far as volcanic action is concerned, over a large portion of the earth's surface during which, a deep sea with extensive shores prevailed. Then as now, the waves beat the surface and washed the beach, until round pebbles and fine black sand were formed; the wind drove the surge upon the shore, forming the wave and ripple marks, the rains of many ages fell upon the sands and pitted them, and wading birds walked to and fro and left their steps imprinted on the sea retiring bottom: covered up and overwhelmed, converted into rock and raised above the water level they have become a sand stone, containing all the traces and impressions of life and change which have passed over them. This is the old red sand stone of European writers, the system of a few English writers, and the Portage and Chemung group of the New-York State survey. The groups lie in the immediate southern portion of the county of Seneca, and pass out into the neighboring county of Tompkins and farther south. Upon the top of these rocks and still later formed, are found in successive order, the limestone, containing true coal beds, magnesia limestone, new red sand stone, serpentine and chalk, with the green sand of Jersey. These not occurring in this county do not require further notice.

These last rocks conclude the series which have been termed *secondary*, and which commenced with the first bed of fossiliferous slate.

Beds of hard rock are found in many parts of Europe, overlying the chalk, and have from their position, received the name of tertiary strata. On this continent no tertiary rocks are found, but they are represented by beds of clay, sand, and gravel, which from the fossils contained within

Digitized by Google

them, indicate them to have been in the opinion of some, cotemporaneous. These, however, as being on the surface, and in many places forming the cultivated soil of the county of Seneca will be better treated of under that head, and that of the distribution of post tertiary beds over the county.

These were deposited long anterior to human existence on the globe; and the only change which the physical aspect of the county has undergone since, is the silent alteration which the atmosphere, and streams of water effect, in cutting river courses, depositing beds of alluvial clay, and the formation of beds of marl.

The hiatus which exists in the upper secondary beds in western New-York, nothing being found above the old red sand stone, but the beds of drifted sand and gravel of a late tertiary epoch, naturally leads to an inquiry as to the probable causes which led to the non-deposition of the carboniferous limestone, the coal series, and the upper secondary beds which terminate with the chalk series.

That the entire section of country was immersed under water, the deposition of the drift and of boulders is proof; but the want of even deposition of fine sand and of calcareous corals, show the absence of an archipelagic ocean since the period of the New-York system being deposited.

It has been suggested that an inland sea covered the western surface of this State at that period, and observations made on the elevation of the margins or shores of this ancient lake, would tend to support this view; measurements made on the Ontario lake ridge show that the water stood, at various times, at different levels, the highest point of which has been at nine hundred and fifty-six feet above the sea, or seven hundred and sixty-two feet above the present margin of Lake Ontario. Seven shores have been distinctly traced on the sides of the ridge, each below the other, until the present shore is reached. Similar terraces or ancient shores have been traced at the head of Seneca lake. When the waters stood at the highest point indicated, the area occupied must have been of immense extent, limited by the Highlands and the New England range on the east, the shores of Lake Superior on the north, the Alleghanies on the south, and, perhaps, by the region of the head waters of the Mississippi on the west. The outlet of this vast body of water, was probably by the St. Lawrence, the Connecticut, the Hudson, and possibly by the Susquehanna, each of ampler dimensions than at this day, and probably being united, to some extent, the valley of the Connecticut formed the chief channel. The deposition of drift which occurred at this period of time, may be traced down that valley, in the large number of boulders deposited in its bed, with the fact also, that those reposing on the opposite shore of Long Island, are of

Digitized by Google

Connecticut origin; the supposition may be hazarded that this position was the chief embouchure of the inland waters.

Such a sea flowing toward the southeast, carrying a large amount of drift with a strong current, and subject to the periodical lowering of its level, at long intervals, must have had great effect on the bottom over which it flowed. The deepening of many valleys of western New-York, and especially of the northern part of the county of Seneca, must have been due to this cause. In the vicinity of the Seneca river, the abrasion of the surface of the rocks, and the wearing away of the shale from the underlying Seneca limestone, are evident marks of the existence and force of such a body of water. The erosion of the edges of the Moscow shale, and Tully limestone, on the margin of both Cayuga and Seneca lakes, is a further proof.

The lakes on each side of Seneca county must have aided considerably in giving southerly outlets to this sea, by way of the Susquehanna, while the waters stood at a high level.

Both Cayuga and Seneca lakes poured forth their waters until they subsided to a level of about nine hundred and eighty feet, when Cayuga ceased to flow south, because of its lesser depth; Seneca lake, and the valley south of it, continued to discharge till the waters retired, and brought the level of the sea about ninety feet lower, when the communication between the inland waters and the Susquehanna ceased, and the further drainage was into the Atlantic, by the eastern rivers.

The existence of such an inland ocean would account for the non-existence of the upper beds of secondary rocks, the absence of limestone and coal strata, the deposition and direction of the drift, and the northern origin of boulders.

Onondaga Salt Group—Gypsum Group.

This is the lowest, and most anciently deposited, of the secondary rocks which are found in this county. The group lies upon a bed of limestone, which, on account of its development in extent and fossil character, at Lockport and Niagara, has received the names of Lockport and Niagara limestones; it was previously termed geodiferous and bituminous limestone; and is coeval in deposition with the Wenlock limestone of the upper Silurian rocks of British geologists.

This rock dips south at a gentle angle, and lying upon it, and partaking of the same southerly slope, are the series of beds which contain, as their characteristic ingredient, sulphate of lime, or plaster.

These beds consist of slates, indurated marls, limestones, containing silica to a large amount; and beds in which limestone exists, but in amount inferior to the alumina or clay. The majority of the beds contain alumina

Digitized by Google

in excess; they weather or crumble rapidly on exposure, and form ashen gray and drab colored soft shales, which give the characteristic appearance of the group.

In the New-York State Survey, this group has been subdivided as follows, commencing from below:

1. A bed of blue and green shales, with occasional bands of red.

2. Green and ash colored marls, with their seams of fibrous gypsum and colorless selenite, and occasional small masses of compact gypsum.

3. Gray and ash colored marls and shales, containing the workable beds of gypsum.

Between the different portions of the deposit there are no well marked lines of division, but each in its entirety is sufficiently well defined.

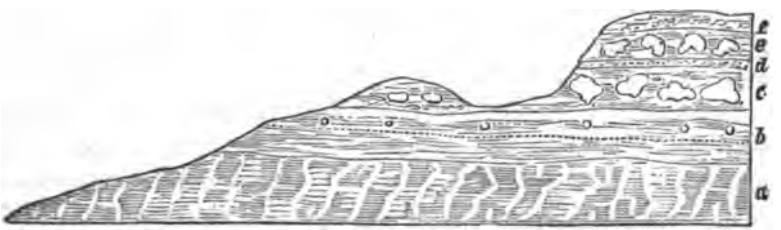


DIAGRAM FROM THE STATE SURVEY.

(a) Green and blue shale with red.
(b) Shaly limestone with fibrous gypsum.
(c) Lower gypsum bed.
(d) Shaly limestone with cavities and fine pores between beds of gypsum.
(e) Upper gypsum bed.
(f) Light gray and drab colored limestone.

This group, which extends across the State in a narrow belt from the south and west of Niagara county to the west border of Montgomery, has perhaps its greatest width where it crosses the county of Seneca, owing to the denudation of the super-imposed rocks on its southern edge. It occupies the whole of the county north of the Seneca river, (except that portion of the town of Waterloo where it is covered up by limestone,) embracing the whole of the towns of Junius and Tyre; all but the southwest corner of Seneca Falls, and that portion of Waterloo north of a line drawn from the village and trending northwest into Ontario county.

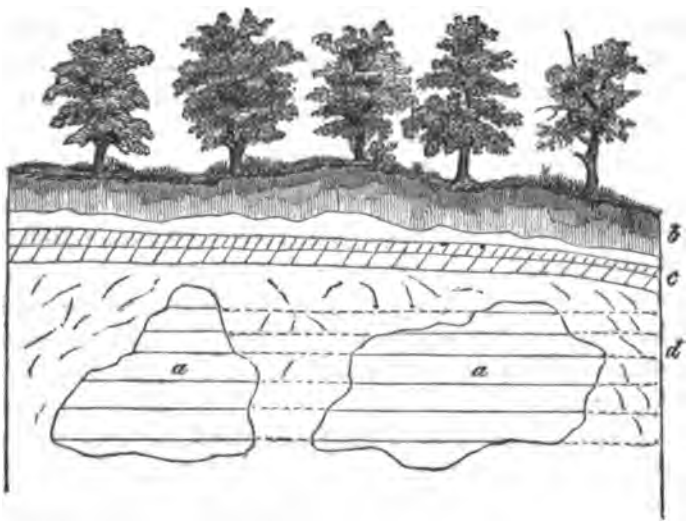
There is, however, scarcely any external evidence of its existence, as the uppermost rock of that district, except the appearance of springs as at Dublin, (in Junius,) charged with sulphates of magnesia and iron, derived from the leakage through the gypseous shales.

The rock can scarcely be said to appear upon the surface, by elevation of the strata, but rather to be exposed by natural or artificial cuttings, as at

Digitized by Google

Bear Creek, and a few localities where wells have been sunk north of Seneca Falls village, being covered up by alluvial and tertiary deposits to a great depth, varying from fifteen to fifty feet, as is noticed when treating of the soils of Junius and Tyre.

The waters of the Seneca lake, in their passage eastward, have their outlet through the overlying shales and limestone, and have worn their track along this group, exposing its upper beds, which extend on either bank of the village of Seneca Falls, near the fall of the river, extending two and a half miles down the stream.



SECTION OF GYPSUM BED AT MR. SWABY'S FARM.

(a) Gypsum rock. (b) Clay. (c) Limestone. (d) Gypseous marl.

The greatest exposures of the rock are on the north bank, on the farm of Mr. Frederick Swaby, and also on the ground of Mr. Cady. The rock on Mr. Swaby's farm was extensively worked at one period, and before he purchased the property; but, owing in some degree to the limited size of the beds, but chiefly to the neglect of the parties who worked the quarries, they are not productive. The difficulty seems to have arisen from the omission of separating the rock from the shales and marly limestone which surrounds it, any large proportion of which would, by its tendency to fall apart, destroy the property of the cement.

Although the upper layer of gypsum beds are by no means so valuable as the lower, yet from the size of the masses of rock on Mr. Swaby's farm, where it is exposed by the river, and the capability of getting it free from

Digitized by Google

the surrounding decomposed bed, there is but little doubt that with ordinary care, a pure plaster could be obtained there. The height of the cutting is about forty feet, and the upper bed of rock, the drab colored limestone is covered by a few feet of soil; it is about six feet thick, in thin courses, broken into fragments, and underlaid by several feet of decomposed clay, shale, and marl, with gypsum crystals and particles scattered through: both the limestone and the shale have cavities on their exposed surface, partly caused by the softer and more soluble portions of the rock being washed out, by water filtering through. Underneath, and surroundad by the latter, is the plaster in large masses, lying next each other, though unconnected, deposited where formed, and almost unaltered since deposition, for the lines of stratification pass quite evenly from one mass of plaster into another, and quite uniformly through the intervening gypseous marl, thus showing that all were deposited and consolidated at one period.

Some of the masses of plaster exposed are of considerable size: one is estimated to be fifteen feet high, and thirty-five feet broad; the bottom has not been fully exposed by cutting. Thin veins of selenite, in small rhomboidal tables, as well as in silky filaments, occur through these beds. On the south side of the river, and opposite to Mr. Swaby's quarries, the bluffs of gypsum rock approach the banks, but they have not been exposed, except by cuttings in a few places, and the indications were so poor as not to justify further attempts.

These beds are the same as on the north side, the upper layer being covered deeply by the marly shale.

As the whole of the soil between the river and the road leading to the Cayuga bridge, is underlaid by this group, some points might be readily selected, where by excavation, not only good upper beds, but the lower and better beds of gypsum could be reached; it is in this angle alone that good beds of plaster can be expected, in this county, and when opened they will probably be worked economically and profitably.

Farther east the plaster rock makes its appearance on the north side of the river at the railroad bridge, and again on the south side, a short distance from a cut made through the bank by the railroad company for the purpose of filling the low ground at the margin of the lake; this cut has exposed the plaster, which is covered by a great depth of clay, in some places it is probably twenty-five feet in depth. This bed is on the farm of Mr. O. Tylor, and gives promise of future value. The present cutting has been made east by north, and exposes the edge of the strata; the beds of shale, of which there are four courses distinctly marked, are slightly curved, with their convexity upward; here, also, the stratification passes

Digitized by Google

from the rock into shale. Some of the courses of gypsum rock are of considerable thickness, one bed being four and a half feet, and another two and a half feet thick; as far as now visible, this promises to be a good opening with many local advantages. The plaster stone is of a deep blue color, very dense and filled with crystalline plates of selenite; it effervesces strongly with acids.

The limestone which overlies the group at Seneca Falls, is of a hard texture, and interspersed with cavities here and there, which are filled with crystalline incrustations of carbonate of lime in mammillary concretions; this deposit of carbonate of lime, concretes the marl and shale below, into forms resembling breccia or conglomerate, and is produced by the trickling of springs through strata of limestone and depositing the lime which the water held in solution, in these cavities.

Masses of this stalactitial character have been found on the south side of the canal bank, below the village, where a calcareous spring oozes out from the rock; the deposit from the water of this spring, is so even, and ribboned as to give the appearance of agate when broken across, and as it takes a polish the material can be wrought into various objects of utility, but more appropriately into ornaments.

These same springs carrying down sulphate of lime into the shale, and depositing it slowly, produces those colored stellar crystaline masses of gypsum found in the marl.

Lying above the limestone before alluded to, is a thin bed of stone, partly silicious, partly alluminous and containing some magnesia; it is blue when first exposed, but afterward changes to a drab or grey color. It is a silico-argilaceous limestone; and from it, in other localities, has been obtained the useful hydraulic lime, or water cement. This rock which appears on the eastern shore of Cayuga lake, and also, at Phelps in Ontario county, does not present in the beds of Seneca county, the same useful properties. These properties vary inasmuch as, one portion contains too much carbonate of lime, and another too much silica, and such is the character of the rock at Seneca Falls.

Every good hydraulic mortar depends for its success upon the formation of silicate of lime. This must be formed by the agency of water, which is partly taken up, thereby forming a hydrated silicate. The only essential constituents there are silica and lime, and water to produce the combination; but few stones have that simple constitution; they contain other bases, such as oxides of iron, and manganese, and magnesia, and even clay, (alumina,) which unite with the excess of silica, to form double silicates, which in the case of manganese and magnesia, are very insoluble, and

Digitized by Google

therefore render the mortar harder and more durable. It is for this reason it has been deemed necessary that a hydraulic stone cement should contain magnesia. It is possible, if a stone do not contain the exact ingredients, or these not in due proportion, so to amend their character as to produce ultimately a good cement; and it is well known the best lime cements for fine works, are those which are made artificially. The silica in a cement stone should not exist as ordinary sand, or quartz powder, but in that peculiar state in which it will gelatinize with an acid, that is, just when it has escaped from its combination with a base.

It may be brought into this condition by calcining it with an alkali, as potash or soda, or with an earth at a bright red heat. When mixed with water the ground stone will then set in a cement.

If a limestone contains clay in a less ratio than ten per cent, it will burn as common lime, and will *not* cement. If it contains twenty per cent of clay it will slake, but it *will* also *cement*. If it contains an amount of clay equal to thirty per cent, it will *not slake* well, nor heat, but forms an excellent cement. If the natural stone contains other bases besides clay, as magnesia and iron, and perhaps manganese, which may be determined by analysis, it is easy, in order to render it a good cement, so to adjust the proportions of these bases, that in affinity they shall represent the thirty per cent of clay. Great care should be exercised in the burning, as many good hydraulic limes are rendered worthless by over-burning, partly owing to the silicates becoming fused by the heat.

The water limestone being like other beds, a deposit from saline waters, it must vary in different localities to some extent, and hence the discordance between the economical values of this stone, in this county and the county of Ontario.

The southern border of this limestone being hid under Seneca Falls, it has not been examined. A few courses may be seen south of the falls, and at the quarries of Mr. Wuchter and Mr. Chamberlain, in Scauas, but the stone is not well marked in its characters. A mill in the village of Seneca Falls is constructed with this stone, obtained from the immediate vicinity. Upon examination the grain is very coarse, and is full of geodal cavities.

Marcellus Shale.

This term has been applied to the mass of fissile fossiliferous blue slate, which overlies the Seneca limestone. It corresponds with the pyriliferous rock of Dr. Eaton, and has hardly a representative in the British rocks formed in the upper secondary period, the deposits which were formed at coeval periods being, in the two continents of very different amounts. These, which in the eastern states amount to several thousand feet in thickness,

Digitized by Google

do not reach as many hundred feet in western Europe; hence arises the difficulty of finding the representatives of each, or applying a common name to both.

This bed of shale may be considered in many respects as resembling the numerous beds of overlying slate, which have received the name of the Hamilton group; yet as it has been treated separately in the State survey, it may be useful to continue the subdivision in this work.

The characteristics of this bed are, a black, or black and blue slate, easily broken, or weathering into small fragments; under the finger it splits into thin laminæ, which when separated, display the hollow of a fossil mollusc shell, to the abundance of which this rock appears to owe its extraordinary fissibility. It is very soft, and may be marked by the finger nail, or crushed under the fingers, and from the excess of alumina, (or clay,) it is decomposed readily into a tenacious clay. When broken a whitish, dotted frosting may be discerned on the fresh surfaces, produced by a decomposition of the iron pyrites in the stone, producing a sulphate of alumina, and a sulphate of lime, which crystallize at the spot where produced.

This shale occupies a considerable portion of the county, the extent of which may be seen by a reference to the geological map. Its northern line is the southern limit of the Seneca limestone, stretching across the county from the Cayuga to the Seneca lake. On the shores of the latter it displays its greatest width, occupying the space from lot number 2, in Fayette, on the Seneca river, the whole surface of the town as far as the northern half of lots number 32 and 33, and the middle of lot 34; passing south in an easterly direction to Cayuga lake, it passes out on the north limit of the south tier of lots of "the reservation," thus including an area of about twenty-eight miles of the county, and embracing the northern and middle portions of Fayette. Much of the northeast of Fayette is covered by this shale, but as it only caps the limestone, which is also exposed, the latter has been treated as the surface rock of that portion of the county.

Abundant opportunities are offered for examining this slate on the Seneca lake shore, commencing one mile south of the outlet, where it rises from under the water, and attains an elevation of from ten to eighty feet above the water's edge. On every elevated ridge of land it either appears on the surface, or is found at from one to six feet deep, the plow often turning it up. On the exposed road surfaces, at almost every sinking for wells, and on the side of the water courses, where drift clay has been washed away, it forms the surface rock. Its repeated fractures, and upheaval of the edges, are marked along the face of the town by the ledges of land pointing in a direction N. N. W. and S. S. E., the bluff end being northeast, and the

Digitized by Google

gentle slope to the southwest. These ridges are more distinctly marked on the western side of the town; and there also the whole land is more elevated, showing that the local cause which produced these, was more influential on the western edge of the county. What that influence may have been, is noticed when treating of Seneca limestone, and in confirmation of the truth of the view advanced, may be adduced the calculations of Brischoff, derived from observations, which show that a mass of sandstone five miles in thickness, heated to 100 degrees, would undergo an elevation of twenty-five feet by mere force of expansion, while a mass of clay rock, (slate or shale,) will, on the contrary, undergo contraction, producing fracture of the mass. Where then expansion of one mass of stone occurs, with fracture of portions at the opposite end, these latter must be inevitably displaced from their horizontal position, and produce that undulating surface of country which Fayette exhibits.

Though constantly appearing on the surface, the Marcellus shale is not very thick, certainly not equal to the shale bed in the counties east, the shale thinning off as it passes west. Over the north and middle of Fayette it cannot be more in any place than sixty feet, and that occurs on the Seneca lake shore, for it gradually thins off at the eastward and northward. The limestone quarried near the county poor house, and the quarry of Mr. James Rorison, crop out without any covering; while at Mr. A. Rorison's, further west it is twenty-five feet below the surface covered by two feet of shale. On lot number twelve, the shale is eight feet below the surface, and fifty-one feet thick; the limestone is then reached; and over the whole district, the distance at which that useful stone lies, can easily be determined by the simple process of boring, and in some instances can be profitably worked. Carbonate of lime forms a small constituent of this rock, it effervesces with acid, and yields about four per cent; this proportion varies, increasing in some spots to a thin seam or streak of limestone, in other places resulting in the formation of nodules or concretions of limestone deposited from water trickling through the mass of clay before it was fully consolidated.

The iron pyrites so abundant in very minute grains through the rock, causes by its decomposition, the breaking up of the mass into fragments, and the liberation of sulphur which passes as sulphureted hydrogen into the water; The waters of Fayette are but slightly impregnated with this gas.

The abundance of vegetable matter is the cause of the deep tint to the shale; its decomposition produces the bitumen which is so diffused through some of the seams as to give them the character of coal, as it

Digitized by Google

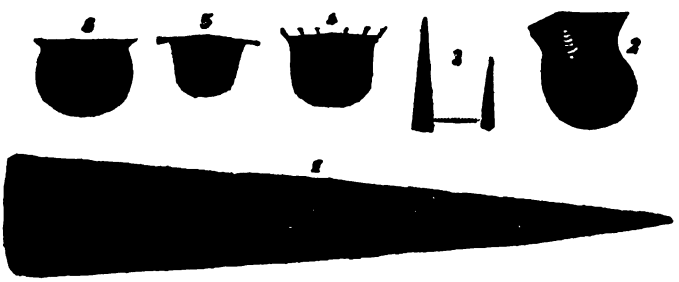
burns in the fire with a strong flame; in some of the nodules cavities exist, which contain bitumen.

The fossil species of this rock are not numerous, though the individual number is very great. The upper layers contain atrypa and orthis in great abundance. Tentaculites, an occasional goniatite impression, and strophomena, but the predominant mollusc of this rock is avicula. The forms of shells are well preserved in the rock; they are of the minute and delicate species and imply from their preservation, as well the fine character of the clay in which they are imbedded, as the quiet condition of the deep ocean bottom on which they lived.

From the fissile character and ready decomposition of this shale by the air, it is unfit for any industrial uses. It should not be used where a less argillaceous stone could be had.

It has gradually rendered the drift soil overlaying it, more stiff and more retentive of water; and there are few places in the town where it could be considered any improvement to bring it to the surface.

Fossils in the Marcellus Shale.



1. Orthoceras subulatum.
2. Avicula lævis.
3. Tentaculites.
4. Strophomena setigera.
5. Strophomena mucronata.
6. Strophomena pustulosa.

Seneca Limestone.

This "corniferous limestone" of the State survey is uniform, both in its mineral character and fossil contents, in its entire extent; which is from the Hudson river on the east to the Niagara on the west.

This rock which lies immediately above the gypseous group and bounds its southern margin, in a fine grained compact stone of a deep blue color, shewing very fine shining crystaline facets when broken. The upper inclines to a greyish tint, and from containing alumina passes to an ashy shade. It contains masses of black flint or hornstone imbedded in the strata, and occasionally extended as their streaks or lines separate the beds. This

Digitized by Google

insertion of flint between the masses, increases, west of the county to such an extent as to thin the limestone, and almost alter its character.

This rock when exposed has "its calcareous matter soon dissolved out, leaving the hornstone in jagged or irregular projecting points, from which it receives the local name of chawed rock."* In this county the alteration of the rock does not occur in place; but small rolled stones out of the drift, are found scattered over the surface to a short distance south. In the strata when exposed, the beds are in a few instances separated by a talcose shaly clay.

Although its position is that of a band across the western counties, yet in the county of Seneca it occupies no more than an area of six miles. About one mile and three-fourths west of Waterloo, it appears under the bed of the river, and crosses over to the southern side and is traceable eastward toward Cayuga lake, where it passes out of the county about one and a half miles south of Canoga. Its northern limit is the southern boundary of the gypseous group.

Through a large part of this section, especially in the northeast part of Fayette it is covered by the rock next in succession, the Marcellus shale, but is exposed in several places, owing to the strata being altered from their horizontal position, cracked in several places, and the southern end being depressed. The dip of the rock is slight, and those alterations which have been caused by movements from below, have left few traces on the general surface of the country, which is slighty raised above the level of the surrounding land and is gently undulating.

The thickness of the bed of shale which covers this limestone varies, but in many places is not more than four feet. On Mr. Hoster's farm, (lot 37,) it can be reached at from six to eight feet deep; and on the ridge, and many of the undulations within the district named, the shale does not cover it to any greater depth; at other points the rock comes to the surface, or is covered by a few feet of clay.

The total thickness of the limestone does not exceed thirty feet in this county, and includes five or six beds or strata, varying from nine to eighteen inches thick. In every quarry which has been opened, the same strata are exposed. Thus, the courses in Mr. Chamberlain's and Mr. Wuchter's quarries are similar to those of Mr. Rorison's and Mr. McAllister's, showing that the original horizontal bed has been fissured and exposed in several places, and though occupying so many miles of surface, it is only twenty-five feet in depth.

Its brittle character, its blue color, and its fine grained and compact

* State Survey.

Digitized by Google

structure, tell its history. Similar to the other limestones of the county, it is not the aggregation of remains of innumerable molluscs, corals, and other shelled sea-water animals, but the result of the deposition of a mud, whose basis was a limestone rock originally, and which, being carried with some rapidity, and copiously deposited on a sea bottom of great depth, was so circumstanced that no animal remains could be included in it, except of those which were dead at the time, or could not resist the depositing current. That it was of great depth may be inferred from the compactness of the stone, and the absence of coral remains. The upper beds are cracked in many places by fissures, and traversed by joints which run in two directions, one east and west, the other northeast and southwest; the general dip of this rock is south by one point west.

This rock has been quarried for building purposes, and for conversion into caustic lime, in several places.

On the Seneca river, near Waterloo, it has been raised by Mr. Enoch Chamberlain.

At Scawas, or South Waterloo, by Mr. H. Wuchter.

On lot No. 15, by Mr. James Rorison.

On lot No. 27, by Mr. McAllister.

Also, on the county poor-house farm, and a few lesser quarries.

At Mr. Chamberlain's, where the beds are well exposed, the general character of the rock can be well examined. In this quarry, six beds or strata are exposed, the soil above covering them to a depth varying from two to eight feet. The two upper beds are cracked and fissured in several places, down which the water passes, and freezing in winter breaks it in smaller fragments, fit only for the kiln. The fourth, fifth and sixth beds below the surface yield the largest blocks of stone; the third bed is the thickest, being about four feet deep; between the third and fourth bed is a seam of shale, from eight to twelve inches thick, which, when exposed to the air, chips and falls to a fine soft powder, of a light brown tint; while fresh it is grayish, soft and unctuous; it is a magnesian mineral, and might be classed as a talcose slate. This material might possibly be made to answer the purposes of French chalk, or fullers' earth; when ground and well washed, it might be an aid to pottery clays; or, when weathered, it might be the basis of a compost advantageous on loose and sandy ground, as an addition favorable to the wheat plant.

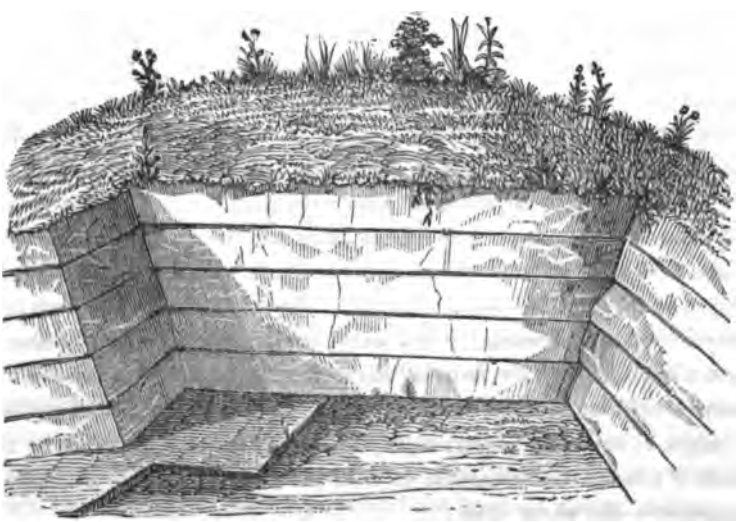
As a material for building, the Seneca limestone affords the most durable and beautiful block of any beds in the county, and where free from the flint veins, or horn stones, it can be dressed with great neatness and facility under the chisel, and form an important item of industry in the county.

Digitized by Google

The faults in these beds of limestone give origin to severa springs. and streams of water, of which the most remarkable in the district is that of Canoga. The slips which this rock has made may have been caused either by upheaval, or by the removal of the soft gypsum rock below, allowing the higher strata to fall down. To this latter opinion the geologists of the State survey incline; yet it is quite as possible to be produced by the pressure caused by the upheaval of rocks at some distance. Thus the undulations which caused the bending of the strata in the southern part of the county, may, by their progression through a more brittle mass, have resulted in the fracture and tilting up on the edge of the Seneca limestone.

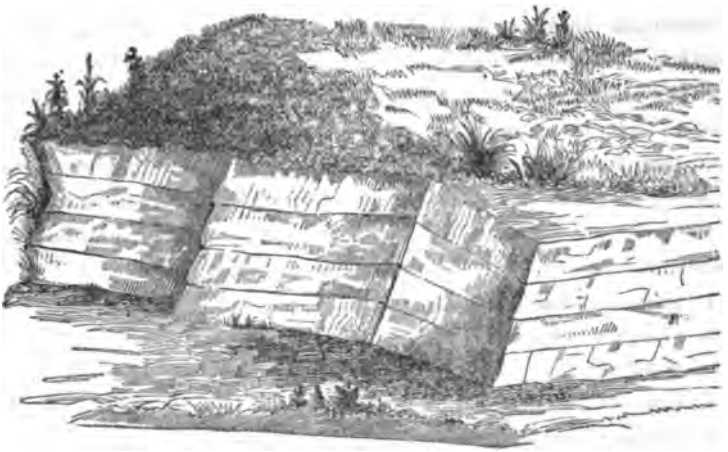
The fossils of this rock are few. Vegetable matter gives to the whole mass a tint of blue, which occasionally is so deep in tone as to be almost black. The dark color is due to bituminous matter, and small portions of bituminous coal have occasionally been taken from between the strata of stone. Of the animal remains, the strophomena lineata is the most abundant and characteristic. Cyrtoceras undulatum, and stophomena undulata, these are delineated in the annexed sketches as also the quarries at Scawas in the town of Fayette.

Quarries at Scawas, town of Fayette

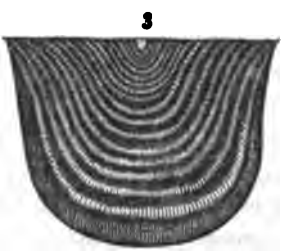


Digitized by Google

Quarries at Scawas, town of Fayette.



Fossils in the Seneca Limestone.



1 Cyrtoceras undulatum. 2 Stophomena lineata. 3 Stophomena unguata.

Digitized by Google

Hamilton Group.

Under this head are included all the beds of rock which underlie the middle portion of the county, commencing about the south tier of lots of the town of Fayette, and extending to the boundary line of Romulus and some parts of Ovid, presenting a convex margin to the north. It has derived its name from its development in the town of Hamilton, county of Madison. In the State survey this group has been subdivided into six different series, of which five are shales or slate, and one is limestone. In an ascending scale from the lowest bed, they have been termed,

1. Dark slaty fossiliferous shale.
2. Compact calcareous blue shale.
3. Olive shale.
4. Ludlowville shale.

} (5, 6, 7.)

5. Encrinal limestone, (8.)
6. Moscow shale, (9.)

The numbers included within parenthesis refer to their position on the geological map.

Lying between the thin bed of Marcellus shale which dips under, and the Tully limestone which overlays it, and forms a well marked southern boundary, as a class of rocks, they are readily recognizable. The subdivisions of this group have been founded partly upon the mineral character of the beds, which in some of the series differ from each other, and partly upon the different character of the fossils imbedded in it.

They may be recognized and examined with great facility on the eastern shore of Seneca lake, where, from the constant action of the westerly winds, the shore is kept in a bold state, with the naked rock exposed. In many of the ravines on this shore, and on the western side of Cayuga lake, similar opportunities are afforded. The Cayuga lake shore in this county being less undulating, and less exposed to the action of agitated water, exhibits these shales to less advantage.

The deep waters which existed during the period of the deposit of the Marcellus shale, was also prevalent during the long period which was necessary to deposit beds of such immense thickness as are included in this group. From inspection of the beds in several places, the depth of this group cannot be less than six hundred feet. During deposition, the waters were unusually quiet, and disturbed only by a slight current running in a northerly direction.

The fineness of the character of the deposit, the perfect condition of the fossil impressions, and the species which they include, imply these conditions.

Digitized by Google

The first enumerated of these beds, the "Dark slaty fossiliferous shale," underlies the southern lots of the town of Fayette, and the whole of the town of Varick, except the lots 61, 62, 63, and part of 59 and 82. Its northern boundary is the limit of the Marcellus shale, from which it may be recognized by a separating line of very thin shale, which in many places has crumbled into clay. Underneath this it becomes a slate of a dark blue or even black tint, which separates into thin laminæ; not, however, sufficiently large or regular to constitute a flag stone. Like the shale which overlays it, it is almost entirely argillaceous, but in several places carbonate of lime appears and accumulates, producing not only nodules and concretions of this mineral, but also thin streaks of limestone, never sufficient in any of the places examined to constitute a layer of limestone. Small as the quantity of this mineral has been in the rock, it is sufficient to have produced the circumstances favorable for the development of testaceous animals, where shells are found in these spots.

In the quarry situated on Mr. Lerch's farm, (lot 31, in Fayette,) this shale can be well seen; some of the layers split well into small flags, but the greater portion break off into shaly fragments, which are highly fossiliferous, and contain numerous casts of cyathophyllum. On lot 38, a short distance north of Mr. Kidd's dwelling house, this shale may also be seen with advantage. On the Seneca lake shore, along the same meridian, the dip is very nearly south-southwest. In many places in Fayette, it is deeply covered by a drift clay and soil thirty feet in thickness. By gradations nearly imperceptible, the last shale merges into a bed, marked six on the map, termed the "compact calcareous blue shale," which at once implies its composition and structure; it is a slaty, cleavable rock, not so fissile as the two foregoing, upon which it reposes. Like the preceding, it is a clay rock, having an increased per centage of lime, which continues to augment until the upper beds are reached, where this mineral so prevails as to give the character of a limestone rock, and render it suitable for the purposes of burning. These beds are marked by the presence of the fossil Delthyris.

This bed of thin limestone separates the shale from another bed which lies above it. This, the "Olive shale," is more fissile than the last named bed, is very calcareous where it is in contact with the limestone layers, but farther up it loses this character, and becomes of a dark olive tint, which is due to the presence of a manganese mineral.

It is much more freely decomposed and weathered than the blue shale above, and, where exposed, it crumbles readily into soil. It is protected from extensive action by the overlying shale, as may be seen in the ravines along either lake shore. Ascending the deep ravine in the eastern shore of

Digitized by Google

Romulus, on lot 71, this shale is exposed and underlaid by the blue slate. Both beds are here about one hundred and fifty feet thick. The dip of the shale is southwest, at an angle of five degrees. Nearly a mile up this ravine the cascade rolls and pours over the upper beds which are protected by the calcareous beds of the blue shale; these consist of three narrow courses of stone, which protect the shale from the further erosion of the stream; yet higher up the ravine the blue shale appears overlying the limestone seams.

On lot 82, in the town of Romulus, the blue shale may be seen crossing the road, south of the residence of Mr. William Martin; and on lot 98 the olive shale shows itself a few rods south of the creek; on the bed of the latter, the calcareous beds which intervene, may be seen forming the water bed; on lot 100 it crosses the boundary line of Romulus and Ovid, and approaches the Cayuga shore; a few yards south of Mr. Martin's, this calcareous bed was excavated by him, and he found it to possess the properties of a good hydraulic lime; at this spot it lies near the surface, and is covered by a compact blue shale; it slopes off very abrupt, for on another part of the farm the same bed was twenty-one feet deep.

Along the shore of the Seneca lake these two beds are fully exposed on lot 60 in Varick, and on lots 64, 65 and 66 in Romulus. The olive shale contains nodules of claystone and of limestone imbedded in the mass, of various sizes; they are chiefly rounded and do not resemble any organic form; a large portion of some of them is made up of pyrites, which increases their density. Impressions of shells are on their outer surface, and occasionally a shell is found within, around which the deposit took place.

The upper layers of the olive shale lose their fissilility and become compact, retaining the color, but parting with the fossil characteristics which it possessed. Its southern limit is where it passes into a mass of limestone between two and three feet thick.

These upper layers are exposed by the ravines on the west shore of Romulus, and may be seen from the lake on lots 72, 73 and 79, where they are opened by the action of the water. On the Cayuga shore of Ovid, on lot 6, and toward Sheldrake point they may be seen on the margin. The atrypa concentrica is a common fossil of these beds.

A short distance north of Baileytown, this layer of shale is exposed on the lake shore, crosses the county in lots 80 and 81 of Romulus, the north part of 82 and southeast of 77, here it dips under the surface and appears again on the Cayuga shore, on lot 23, south of Sheldrake point.

From its superior development in Cayuga county at Ludlowville, this bed has received the name of Ludlowville shale.

The thin bed of limestone which forms the termination of this series

Digitized by Google

of slates has been termed encrinal limestone from the abundance of that fossil, some times the rock appears to be formed of nothing else but the remains of the stalk of this and several varieties of coral. It is of a brown or clay color, and contains other fossils which are not characteristic. It resists the action of weather and forms the edges of the cascades in a few of the ravines in the northeastern part of Ovid.

The localities of its exposure on the lake shore, are the same as those of the last described shale. It varies from two and a half to three feet in thickness in most beds, yet occasionally it does not exceed one foot. It forms a rough building stone and burns well to caustic lime. It is probable from the proportion of aluminous clay which it contains, that the mortar formed would be found durable, and is therefore worthy the attention of builders. In a few places the clay so far predominates as to convert it into a shale rock; the fossils however serve to distinguish it. Being so very thin, and exposed only in upheavals of slate, it cannot be said to occupy any portion of the area of the county.

The "Moscow shales," as they have been designated by Mr. Hall, from the perfection of the fossils (trilobites) developed in Moscow, Livingston county; lie above the encrinal limestone, and are a bed of great thickness; as it is bounded on the south by the Tully limestone, it can be readily recognized: it is of a dark blue color, composed of fine particles and traversed by seams; it contains more lime than the foregoing shales, and on that account, does not in many of its exposures display a slaty structure.

Where it approaches the Tully limestone it becomes very fossiliferous. It is a soft stone, easily decomposed, and contains iron pyrites disseminated through the mass, as well as collected in small masses of crystals, and concreted into nodules. The glittering golden color, and the weight of these, have impressed a few with the erroneous belief that they were ores of the precious metals.

The rusting along the edges, owing to the iron becoming oxydised assists in breaking up the slate when acted upon by moisture.

They may be examined along the shores of Seneca lake, commencing a few rods below the new Ovid landing and stretching a mile south towards Goff's point.

Almost every creek or ravine on the western shore of the county in Ovid, displays this shale by exposure of twenty-five to forty feet in depth. In the creek, near the shore and leading from the falls of Lodi to Goff's point, this shale may be seen underlaying the Tully limestone.

Along the Cayuga shore it is exposed from the vicinity of Port Kidder to the extremity of the county, and in the ravines along the shore. It

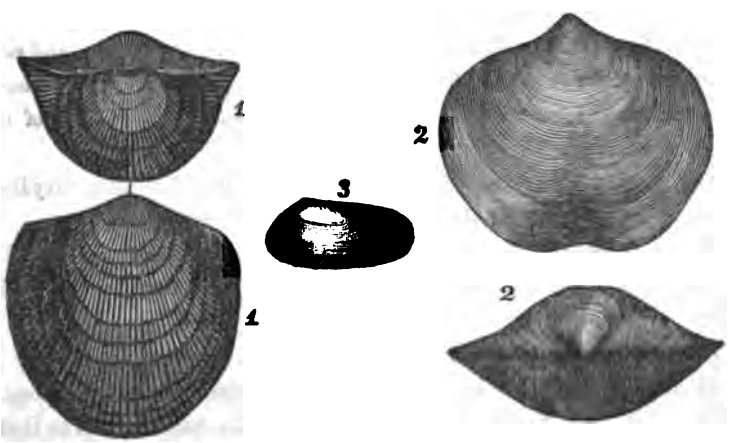
Digitized by Google

passes through the county westward under lots 14, 13 and 5, in Ovid, and embraces in extent the southern portion of Romulus, except the middle lots extending a mile and a half north of Ovid, its greatest breadth there is two miles, but on the lake shores it widens out considerably.

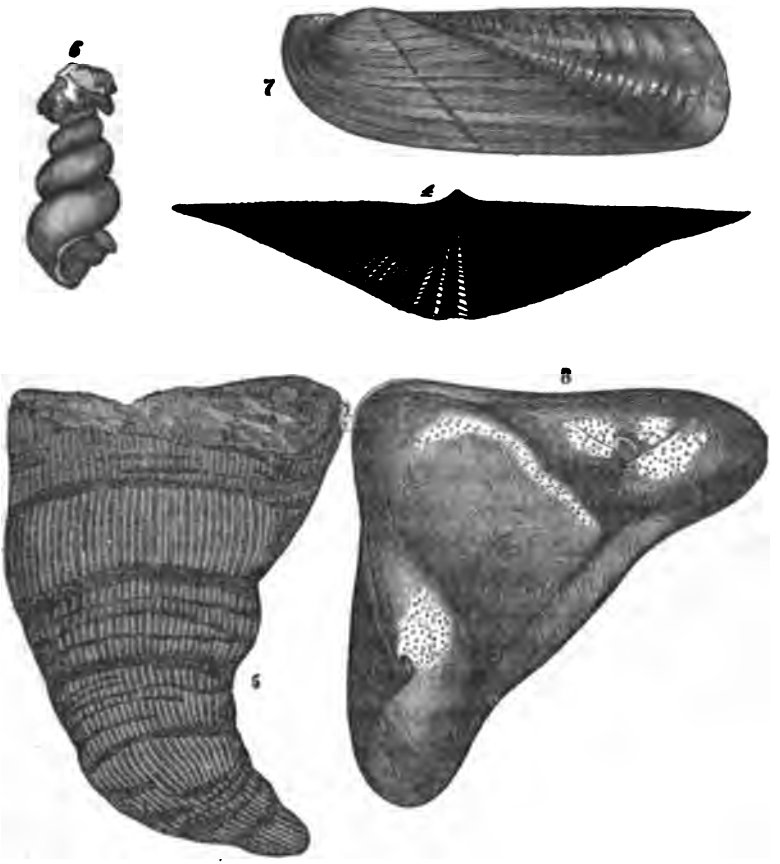
This terminates the description of the Hamilton group. The superior rocks being stripped, it occupies a greater extent of surface in this county than at any point westward. Its greatest breadth is about nine miles, extending from near the south part of Fayette, through the entire length of Varick, and a large part of Romulus, to within a mile and a half north of Ovid, and stretching from thence in a curve, a few miles farther south along the lakes, where, owing to the force of the great mass of waters which once flowed in the direction of Seneca and Cayuga lakes, their shores have been indented on each side. The total thickness of these beds has been estimated at one thousand feet, including the Marcellus shale.

The fossils found in this group are not only sufficient to distinguish their position among the secondary rocks, but also to some extent, to separate the subdivisions from each other; siliceous and argillaceous slates as they all are, with here and there a bed of limestone, from their mineral character alone, but little could be determined in regard to them. The organic life of that period is a more characteristic test, and there is here annexed a list of the most important fossils of this group.

Fossils in the Hamilton group.



Digitized by Google



1 Atrypa prisca, in the olive and Moscow shale.
2 Atrypa concentrica, in the olive and Marcellus shales.
3 Nucula oblonga, black fossiliferous shale.
4 Delthyris mucronata.
5 Cyathophyllum.
6 Loxonema nexilis.
7 Orthonata undulata.
8 Dipleura Dekayii.

Tully Limestone.

This limestone lies above the Moscow shales, and derives its name from the village of Tully, in Onondaga. It is the last bed of limestone which is formed by sedimentary action, or by the deposit of a calcareous mud, the other and succeeding limestones being, those formed as the result of organic life. But these existing only in the carboniferous system, which beds do not occur in this State, it becomes important, inasmuch as it is the most southern bed of limestone in this State. It is an impure stone, sometimes

Digitized by Google

calcareous, sometimes argillaceous, always compact and fine grained, and of a dark and blackish blue color. The usual thickness, in this county, is eleven feet; the greatest observed thickness, about thirteen feet.

It is extensively exposed in the county of Seneca, and where not apparent, is in many places readily within reach, and from its uniform thickness and characteristic color can always be recognized. It stretches across the county in a semi-circular line, the greatest convexity of which is one and a half miles north of Ovid, from thence it may be traced on either side to the lakes.

From the eastern edge of lot 89, in Romulus, it dips southeasterly and reappears on lots 5 and 6, in Ovid, where it crosses the road near Mr. Craven's farm, and is there one hundred and twenty yards wide, it dips again below the soil, and is lost at Cayuga lake, a little north of Sheldrake point, by the removal of the rocks above the Hamilton group. It rises to the surface again on lot 42, the south boundary of Ovid, where Mr. Moorehouse has a quarry; here it crosses a ravine, where it is exhibited probably in its most distinctive features; it then curves south, and is lost under the Genesee slate, which here overlies it.

On the west side of Ovid, the limestone can be traced on lot 43, in Lodi, it may be seen rising out of the Seneca lake, some distance from the shore. In the ravine leading to the falls of Lodi, it is more than fifteen feet above the creek, it ascends gradually, until on the shore it may be seen as high as sixty feet; it continues northerly for a mile and a quarter in a horizontal line, then descending to the north for half a mile, it reaches the level of the lake. A few rods farther north, it emerges from the lake, and rises to a height of forty feet, where it may be seen in a ravine, on lot 94, of Romulus, whence it traverses under 93 and 84, until it emerges again on lot 89, its greatest northerly point or limit. Its uniformity in appearance and thickness is remarkable on the ravine sections, in each of these localities, there are five courses of stone, of which the lowest is the thickest, averaging four and one-half to five feet; the joints are vertical, and far apart, allowing of large blocks to be quarried and removed. From its compactness it resists the action of the streams, and presents a ledge of rock over which the cascades roll. The slate which underlies this rock, (Moscow shale,) is, however, occasionally eaten away, and leaves a large slab of limestone overhanging the chasm; this in time bends, and then breaks off; this effect can be seen on the ravine running into lot No. 94. The action of the Seneca waters have removed the shale, and consequently causing the fall of large masses of the limestone; these angular blocks line the coast for many miles, both on the Cayuga as well as the Seneca shores, and they

Digitized by Google

have often been removed for the purposes of burning, and brought to the head of the lake. The impropriety of removing these masses of stone has been remarked, as it leads to the further destruction of the banks, by the inroad of the waters, whereas if these broken masses were left to rest on the shore, they would remain a natural and perpetual break water.

The curved line which this limestone presents to the north, is due to the effect of erosion before referred to.

After the limestone and superior rocks had been deposited, they were upraised; but the force of the current, which swept onward toward the south, took the channel of both lakes, and swept away the angles of the bed on each side.

The bending of the limestone to the south, and its rising again to form an arc, which may be seen on the Seneca shore, is due to a very different cause.

When this bed, with the accompanying overlying slate, were deposited, the waters were tranquil to a great extent, the bottom was horizontal, or nearly so, on which they were deposited, and the current came from a point south, perhaps a little west, deeper waters existed further east, and the sea bottom gradually became more shallow in Indiana and Illinois. The current taking the deeper channel, carried the fine materials farther out into the sea, and depositing the very fine clay mud farthest north, they being specifically lighter, then nearer to the source of those muds which contained limestone, then the purer limestones, and lastly the sandy materials, which, being heavier, could be carried the least far.

Taking the south as the point of departure, the deposit took place in the following consecutive order:

1. Genesee slate, (containing sandstone.)
2. Tully limestone, (siliceous and argillaceous limestone.)
3. Shales containing lime and sand, (Moscow and olive.)
4. Shales containing much lime, (blue shale.)
5. Shales containing little lime, (Marcellus shale.)

In the western states, where the belt was shallower, the deposits were of course thinner and more sandy.

After final deposition and consolidation of these beds, and perhaps after the deposition of the old red sandstone of the southern counties, (the Portage and Chemung group,) volcanic upheaval and undulations occurred. Of the former action there are no true indications in this county, and the latter can only be inferred from the appearances of this group. The arching of this strata north and south was produced when surrounded by shales as now, for the slate above and below follow the curve of the limestone. The

Digitized by Google

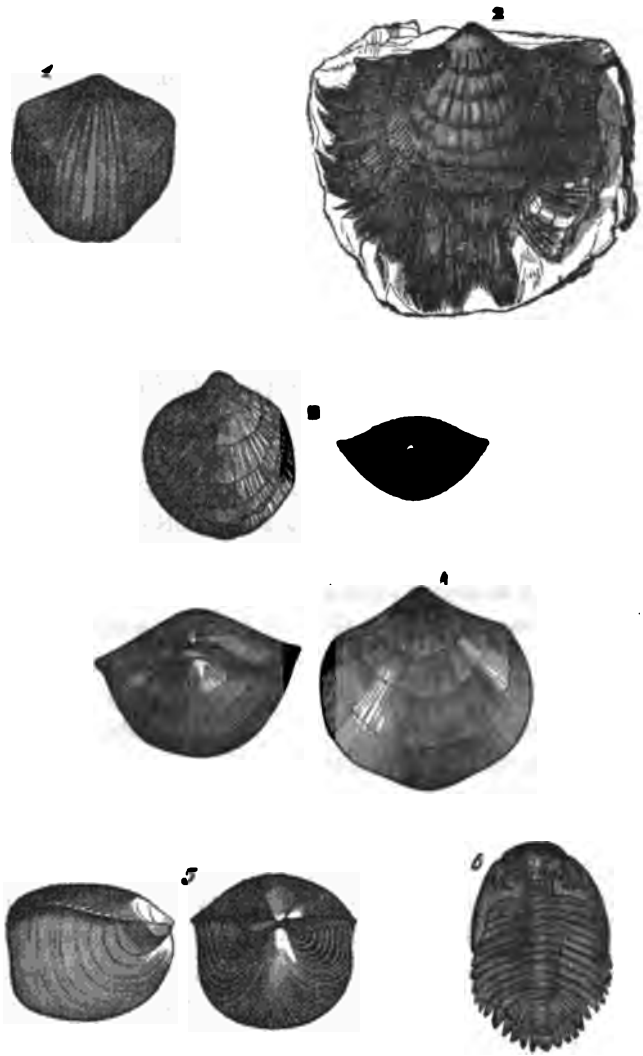
curve being only a few miles in extent, shows the subterranean action to have been limited. That the action was not applied immediately to this locality may be inferred from the fact, that there is no injection, or penetration of the mass from below, no fissures filled with greenstone or trachytic rocks of a modern age. This holds true of this, though Mr. Vanuxem mentions the appearance of two thin veins of serpentine and limestone mixed, resembling trap rock, found in close connexion with this limestone at Ludlowville; this being the only locality where such has been observed, and that of too small an amount to justify the belief of such action being the cause, almost the only inference left to be adopted, is that this curve is the result of an undulation of the surface, a wave transmitted through the bed of rock, and derived from a distant point south. The motive force below bending the stratum as it passed along, partly perhaps by upheaval, but mostly by its heating power, producing expansion upwards of the overlying mass. Those beds susceptible of the greatest expansion will curve most, while those differently affected by heat, will either not curve, or as in the case of argillaceous beds, dry out, and crack. This has been before alluded to when treating of the shales which underlie this bed. To produce the curvature, a fixed point at the extremity is required. Whether the presence of the great mass of waters which overlaid the beds towards the north, coupled with the cooler beds in that region, would afford the necessary "point d'appui," is a suggestion thrown out, rather than a reason given.

The lime obtained by burning the Tully limestone is not always white, owing to traces of iron and manganese, which the stone contains, and which stain the stone of a red or olive color, or tint in some places. The lowest and thickest bed is generally very pure. It is capable of being dressed very neatly, and would form a fine building stone, and as the joints are in a vertical direction, there is little lodgment of water in quarrying these stones; the joints being distant also, allow of large blocks to be raised if care is observed. It does not appear capable of affording the finer slabs and sills, like those obtained from the beds of Seneca limestone, but it can afford square stones of almost any desired dimensions, and being a compact stone, of good quality, and easily reached, it deserves more attention and extensive use than it receives at present.

The fossils of this limestone are not numerous in Seneca county. They are atrypa cuboides, affinis and lentiformis; cryphæus; orthis tulliensis.

Digitized by Google

Fossils in the Tully Limestone.



1 Atrypa cuboides.
2 Atrypa affinis.
3 Atrypa lentiformis.
4 Orthis tullensis.
5 Atrypa.
6 Cryphæus.

Genesee Slate.

This slate is the "Upper Black Shale," of the State survey; it occupies a large area of the southern part of the county, including the whole of the town of Ovid and those of Lodi and Covert, except so much of the former as is denuded at its eastern and western margins, and of the two latter

Digitized by Google

where by the cuttings of the ravines, the lower rocks are exposed: it stretches north a short distance into Romulus, and underlies the town of Ovid, occupying an area of about sixty-five square miles, and next to the Onondaga group, is the most extensively diffused bed.

It is generally of a deep black color of a slaty structure, passing in a few places into a hard siliceous grey or ashy stone, ringing under the hammer; the surfaces of these last mentioned layers, glitter with the light, owing to fine particles of mica disseminated through the stone.

The beds of dark slate contain very few fossil remains; and although crumbling readily under the effects of weather and moisture, splitting into fragments, yet when placed with their edges outward they withstand the action of the heat remarkably well, being good fire stones and remaining almost unaltered used in a back as fire places for forty years; they have been used in furnaces with equal advantage.

The thickness of this bed of slate varies, but in the average, may be estimated at from one hundred and fifty to two hundred feet. It cannot be less than two hundred feet in the ravine at the falls of Lodi; it occupies the whole of the ravine from Mr. Wykoff's mill to the base of the lower falls, below which on passing about a fourth of a mile, the Tully limestone on which it reposes, may be seen, rising on both the north and south sides of the stream. This charateristic rock, at once localizes both the position and depth of the slate, and few if any places in the county gives so good a view of the nature of the Genesee slate as this ravine affords.

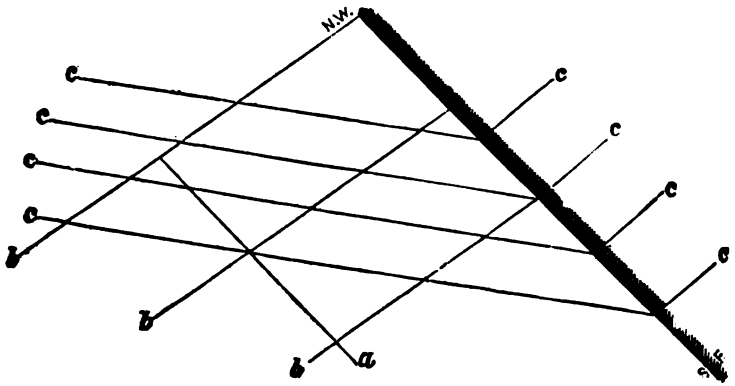
The ravines on the Cayuga lake at the south of Covert, also display this bed advantageously.

The character of the bed is mostly argillaceous, beds of dark slate, which split irregularly, and black shale, which is fissile. These occupy several feet from the surface and are succeeded by a few layers of sandstone which are from three to eight inches thick, they laminate as slates and have the jointed seams of the shale passing down through the sandstone. Two or three of these beds occur of variable quality and thickness; they constitute the flagstone of this section of the country. The joints are from twelve to fourteen feet apart, and therefore allow the flags to be raised of great dimensions.

These joints are vertical like those in the Tully limestone, and are in two directions, one being nearly due east and west, the other, north by east and south by west; this joint often presents a curve, with its concavity to the east; this curving is well displayed in Colonel Pratt's quarries in Covert. These joints are also well seen on lot number 14, in Ovid west of Sheldrake point, where this shale is exposed. Three sub-divisions of the rock may be seen, two of them are the joints, and the third is the true line

Digitized by Google

of cleavage in the slate. In this quarry the joints run north by west; and the same direction was observed by Mr. Vanuxum at Ludlowville.



A and *b* are the two series of joints which determine in the sandstone the size of the blocks or flags; *c c* are the lines of cleavage which are visible on the sides of the ravine, as well as on the floor.

The economical uses of this Genesee slate, are in importance next to the limestones; the shaly, dark and fossiliferous beds are of little value, as they decay rapidly; but not so when the series of flag stones are reached. These are displayed to most advantage on the east side of the county, inasmuch as they are horizontal in that locality, and have been less disturbed, and are less covered by shale and drift. On lot No. 11, in Ovid, at Scott's corners, Mr. Leonard has a quarry, in the lower beds, which are here near the surface, and covered by a few feet of shale; these beds are not the true flag stones, but rather a silico-argillaceous limestone. The stones are thin, but dress well for building or other purposes. On lot 32, in Ovid, is a similar stone, somewhat more siliceous; this stone was formerly called Graywacke slate. There are from three to five courses in a quarry north of the residence of Mr. Isaac Covert; the stones are covered by two beds of slaty shale, and underlaid by black, thin beds of fossiliferous slate. In the fifth bed of this quarry, a fine layer is disclosed, giving a slab equal to twelve inches thick, and fourteen feet long; their surface is marked with vegetable impressions and shells.

A similar stone is quarried further west, by Mr. Van Loo; in an easterly direction these beds thin off; as the joints are far asunder, large slabs may be raised, with due care, of great excellence.

In the immediate vicinity of Mr. Covert's house, and in a southerly direction a similar but upper bed has been exposed, with two good courses of stone, covered and underlaid by shale; the dip of these beds is southwest.

Digitized by Google

The fossil impressions observed on the stone of Mr. Covert's beds are: 1. Lingula spatulata. 2. Orbicula Lodiensis. 3. Lingula concentrica. 4. Avicula fragilis. 5. Strophomena. 6. Terebratula. 7. Tentaculites.

Mr. Isaac Covert's farm, on which is this last described bed, is adjoining (north) of the thriving village of Farmerville, near to which is a series of beds of sandstone, quarried by Mr. Seneca Mundy. In this series the fossil shells are not so abundant, neither are the vegetable remains. These beds are elevated on their eastern edge, and the dip is nearly due south. They afford good building stone, and are full of micaceous grains; the blocks are raised in size about four and a half by six feet. The beds are covered by a clay five feet in thickness, and are arranged thus: three beds of slate, one bed of shale, a bed of good stone, and shale underneath. The stone from this quarry finds a ready sale at fifty cents per perch.

On lot number 86, in the town of Covert, is the extensive quarry of Colonel Pratt. From this quarry is sent forth the largest and finest flagstones. Stones of unusual size have been raised from its beds and shipped to Buffalo, Syracuse, and other principal cities. These beds are covered by a stratum of clay at least four feet thick, and another of shale two feet thick, and are underlaid by blue and olive shale. These quarries do not exceed three to four feet in depth, but they can be quarried laterally, as their superficial extent and quantity is great. The joints are so far apart as to allow slabs to be raised, measuring twelve feet square and six inches thick. The slabs are an even deposit of fine sand, and dip to the southwest, at a very slight angle. They are sold from the quarries at six cents per foot dressed, or in their rough state at fifty cents per load.

Another quarry is opened on lot 74, belonging to Mr. Williamson. The stone is similar in texture to that on lot 86; but is not extensively worked, nor are the blocks as large.

In the beds of black shale the amount of bitumen is very great, giving it the deceptive coaly appearance, which has induced many unacquainted with geology, to believe that workable seams of coal might be found in these shales. The deposit of vegetable matter has not been sufficient to form distinct beds, although it has impregnated the slate so extensively. Under the influence of the pyrites the vegetable matter has passed into the state of bitumen, and this liquid oozes down through the layers and escaping on and with the falling waters, is carried out into the lakes; and as the slope of the beds (S. W.) carries the fluid in that direction, Seneca lake receives the greatest portion of these oozings. There is little doubt, that as the slate crops out beneath the lake, the bitumen also escapes there, and being specifically lighter than water, it rises and floats on the surface. The

Digitized by Google

nodules of claystone, and those masses which with their angular subdivisions, separated by a larger portion of calcareous matter, or earthy sulphates, are called septaria, occasionally contain bitumen in an internal cavity.

The presence of iron pyrites in the shale tends to produce a series of changes in this rock, by its decomposition, interesting to consider. The pyrites may be estimated as made up of thirty-two parts of sulphur and twenty-eight parts of iron in every sixty parts. The iron rusts when exposed to the air, and becomes increased to thirty-six parts. Its increased bulk, and the affinity of the rust, or oxide of iron for water tends to split the rock and hasten its decomposition. The sulphur acting on the air becomes acidified or converted into sulphuric acid, which seizing on the earthy matters of the slate, the alumina, magnesia and lime, form salts, sulphates of alumina, of magnesia, and of lime. These, when formed, crystalize on the surface of the shale, and on its exposed edges, and form those white saline efflorescences which are common in this shale. Common salt also forms a portion of the mass; the presence of vegetable matters hastens these changes, and hence it is, that in this shale, when it abounds in pyrites, alum in native crystals is also abundant.

The middle layers of shale of the Genesee slate, present these conditions, and when exposed, exhibit the action as explained, going on rapidly. At the falls of Lodi, it is a characteristic feature; at the lower cascade, about sixty feet above the waters running from the bottom of the fall, the shales, for ten or twelve feet of thickness, may be traced on each side of the ravine, by the white efflorescence on the surface of the rock, and large quantities of the native mineral may be taken from between the laminæ. It is a true alum schist or shale, and from its exposure, facility of working, and large extent, might offer a reasonable inducement for the manufacture of the artificial salt. The process, as carried out in England, may be explained here, and possibly with advantage, though the detail is not now essential. The process may be divided into four parts:

1. The preparation of the shale. 2. The lixiviation of the shale. 3. The separation of foreign matters. 4. The crystalization of alum.

1. The alum schist is occasionally so bituminous and decomposable, that it is sufficient to expose it in loose heaps, and water its surface, when it falls to a fine powder, and is ready for the second process: more frequently the shale requires to be burned, which is done by brushwood, having a continual, slow heat, and a smothered fire; the slower it is burned, the more alum will be produced.

2. In the neighborhood of the heaps, flagged or wooden cisterns are built, into which large masses of the mineral are placed below, the finest parts are

Digitized by Google

placed on top, and over which is poured a moderate quantity of water; after laying some time, it dissolves out all the soluble matter of the shale, and is usually then transferred to another cistern, where it acts in a similar way, and so on until the liquid becomes fully saturated with the salts. To accomplish this, a series of cisterns, placed on terraces, allow the passage of the fluid as desired. The saline liquid is then transferred to a cistern in connection with a furnace, the flame of which plays on the surface of the liquid, and evaporates it to the point when it just commences to crystalize; by this means some of the impurities subside.

3. The above named liquid is then drained into another cistern, and a potash or ammoniacal salt is added, either sulphate of potash or chloride of potassium is used, the former more frequently. This removes nearly all the alum out of the liquor, and it falls as a white powder to the bottom, which is called "alum flour." As soon as it has settled down, the floating liquor is drawn off, and treated again in the same way, so as to exhaust it. The alum meal requires to be washed once or twice with a little cold water, to free it from iron, which tints it of a brown color; the wash liquors are preserved for future use.

4. The powder is then passed into large leaden pans, where only a little water is poured over, and a gentle fire lighted below it; when dissolved by a boiling heat, it is run off into conical casks, five or six feet high, where it cools and crystalizes on the sides. After lying eight or ten days, the casks are opened, the liquor drawn off, and the crystals transferred into the packing vessels for market. Such is an outline of a manufacture which, for the completion of the various processes mentioned, takes several weeks to accomplish, and an outlay of capital.

The low price of the article, when manufactured, ought not to enter into consideration; but rather the facilities which the locality gives, and the great consumption of this article in many departments of manufacture; several thousands of tons are annually consumed by wool, silk and cotton dyers.

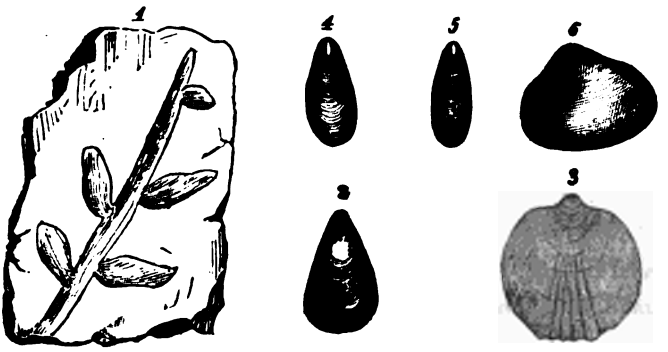
One of the salts which is separated as an impurity, is sulphate of magnesia, or epsom salts, which thus becomes a bye product of manufacture, and tends to diminish the cost of alum-making.

In England, from sixty to sixty-five tons of shale, will produce one ton of alum, which, when made, costs	$30 00
The cost of the alum stone, or shale,	16 00
Leaving the cost of the potash, labor, &c., &c.,	$14 00

Which is considerably above what it would be at the falls of Lodi.

Digitized by Google

Fossils from the Slate at the Falls of Lodi



1. Neuropteris.
2. Lingula.
3. Orthis.
4. Lingula.
5. Lingula spatulata.
6. Nucula.

Those marked 3, 4 and 5, are very common in the shale at the foot of the falls. Fig. 1, is probably a terrestrial fern. When viewed under the lens, the whole mass of shale appears impregnated with pyrites.

This closes the account of the structure and geological position of the rocks as they exist in the county of Seneca. The extent of surface which they occupy may be seen by examination of the map in which the beds have been traced with as much accuracy as possible. A sectional view of the order of position of these beds is also given, which may assist the inquirer. The Genesee slate passes into Tompkins county, and is succeeded by the Portage and Chemung rocks, corresponding to the old red sandstone of European writers. Those who require more information concerning the fossils of the period will be well rewarded for their trouble, by consulting Mr. Hall's volume of Palæontology, in the State Survey, and Sir R. Murchison's work, "Silurian Researches," and his work on Russian Geology. There is, as yet, great difficulty in classifying these rocks, and comparing them with their analogues in Europe. This can only be done successfully by the study of the fossil remains. The comparison of the two may be said to have been sketched, but not filled up, by the State Survey, and those who enter on the field will do so with the assistance of much previous labor, and either by tracing new resemblances, or bringing forward essential differences, confer a benefit on science and on the country.

Digitized by Google

List of fossils common to the rocks of Seneca county.

Gypseous group,.....	Orthoceratite.
	Trilobite.
Seneca limestone,.....	Strophomena lineata.
	Cytherina.
	Favosites.
Marcellus shale,.....	Posidonia alata.
	Orbicula.
	Orthis.
	Septæria spinulosa.
Ludlowville shale,.....	Atrypa concentrica.
Blue and olive shales,.....	Leptæria.
	Delthyris.
	Calamepora gothlandica.
	Favosites.
	Cyathophyllum.
Encrinal limestone,.....	Asaphus, (new species.)
	Avicula reticulata.
	Crinoidal columns.
Moscow shale, ...	Calymene bufo.
	Cryphœus calliteles.
	Homonolotus.
	Atrypa affinis, prisca.
	Delthyris.
Tully limestone, (16 feet thick,)	Atrypa affinis.
	Calymene.
	Cryphœus.
Upper black shale, (150 feet thick,)	Lingula.
	Orbicula.
	Orthis.
	Posidenia alata.

SPRINGS.

The general phenomena of springs, and the principles which regulate the percolation of water though beds of clay or rock, are of importance to the agriculturist, and claim his studious attention.

The quantity of water beneath the surface of the soil depends on the

Digitized by Google

quantity of rain which falls; but the exact relation between the two, depends upon the nature and slope of the rock below, the amount of solar heat, and the level of the surface. The existence of rivers is produced by the latter, and the volume of water which they contain by the former.

The annual fall of rain is consumed in the following manner:

1. A portion rolls off the surface, forming a stream.

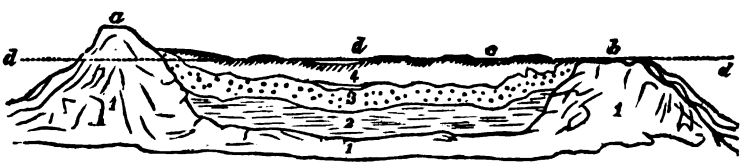
2. A portion sinks a few inches into the earth, and is raised and evaporated.

3. A portion is consumed by man and animals.

4. A portion sinks below the evaporating level into the strata of sand, gravel, clay, or rock.

The last is the only portion to be considered as the cause of springs, and which it may do in several ways.

The water which sinks a few feet into the earth, continues descending until it reaches some bed or bottom which is impervious to water. There it rests, accumulates, and spreads itself laterally along the porous bed, until it reaches the extremity of that bed, when it overflows. Such is the case, when, upon a surface of rock, or upon a bed of stiff clay, is placed a bed of gravel or sand. This may be curved with either end upraised. Such a bed acts as a tube, and delivers the water at its lowest level, and only there, unless tapped elsewhere.

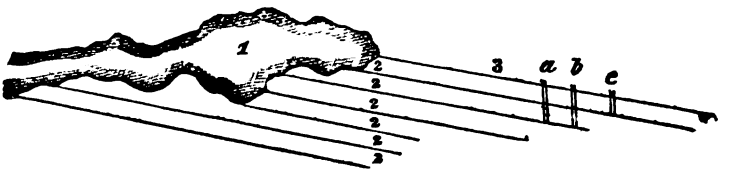


If 1 be the bed of rock, 2 the bed of clay, 3 the gravel bed, covered by 4, another bed of clay, the rain which falls at *a* and along the slope of the hill, will sink through the clay 4, into 3, the gravel bed, where it accumulates, until the whole layer of gravel and sand is full, and rising to the level at *b*, it overflows, because the bed is now in the condition of a syphon, and will deliver itself through the longest leg from the shortest. Upon an examination of the preceding figure it will be seen how water may escape from a level above that of the surrounding country, which water is supplied from some higher level at a distance.

The syphon acts during a short period, or until the water in the legs of the syphons are on the same level, or balance each other, they then cease to flow, until this portion of the leg is again full. If a sinking be made in the earth at c, water can be obtained at any time, and it will rise to the

Digitized by Google

surface constantly. In other cases the spring is produced by the running of water through the thin beds of rock which underlie the soil. This in the county of Seneca, is a very usual source of springs.



If the above diagram represents a vertical section of a bed of drift clay, (No. 1,) lying against the bluff edge of the shale or slate, (2,) all the rain which falls on the clay passes into the seams of the slate, and will be carried downward along the sloping line, until it is arrested by borings or sinkings as represented at *a*, *b*, *c*. It is obvious that it is the rain water which falls upon the slope of the hill at 1, that is collected by boring, for all the rain which falls on the slope 3, rolled down along the surface of the rock.

If this diagram represents the shales of Seneca county, most of which dip southwest, passing under the lake, it is clear that all water which falls on the upland, at the edges of the shale, and which does not happen to be drawn off or consumed, must pass into the lake, escaping from the rocky seams, mixing with and increasing the lake waters.

The quantity of water so disposed of must be very great. That a vast portion is thus derived, is certain from two facts. The lake, although a limited sheet of water, is cooler in summer and warmer in winter than the surrounding air. This could scarcely happen in a small lake, unless it were supplied from a source having a steady temperature which would lower the summer and raise the winter temperature of its waters.

The altitude of the uplands in Ovid and Covert is from five to six hundred feet above the surface of Seneca lake. The lake bottom opposite these shores is more than six hundred feet below the surface waters; as all the beds of shale dip southwest, they reach the lake at or below the water level. An angle of six degrees is equal to a fall of 544 feet per mile. The highest land in Ovid is about three miles from the lake shore. The water which falls upon the hills two miles inward from the lake, must be discharged into the lake at its level, or within a distance of about five hundred feet below the level.

The land on the south of Lodi is considerably higher than Ovid, and will to a farther extent drain itself into the lake at the same points, which are not the deepest part of the lake.

The time which the water requires to pass through these laminæ of rock,

Digitized by Google

and the fact that they pass at depths beyond the heating power of the sun upon the surface, tends to make the water acquire the temperature of the rock through which it passes, which is at these depths the mean temperature of the country, and that is about 48°. This constant temperature of the fresh water passing into the lake has the effect of lowering its summer warmth, and preventing its freezing in winter.

It is a known fact that springs do exist and rise with force in the lake, but for the most part they have only been ascertained to exist at the margin. A search for springs at great depths, and a knowledge of the comparative height of the lake waters, with the fall of rain the previous season, will bring conviction to any doubting mind.

The well known spring at Canoga owes its coldness to the course above described. Its waters have travelled down the slope of the Onondaga group southward, until they reached a fissure or fault in the Seneca limestone, up which it rushes to escape on the surface. Coming from a great depth, it has the mean temperature of the country.

This most interesting spring is on the farm of Mr. Daniel Greenleaf, in lot 34, of the Cayuga reservation in the town of Fayette, and a short distance west from the hotel, in the pleasant village of Canoga. The water from this spring and a smaller one in its vicinity, turns the machinery of the Canoga flouring mills, saw mills, and other works and passes into Cayuga lake.

The spring bed covers a space, about fourteen feet in diameter, is shallow and covered with loose pebbles; the water which rises with great rapidity, is clear, tasteless, and inodorous, and leaves no deposit on the bottom or sides of its basin. The bubbles of gas which rise with velocity and in large quantity are pure nitrogen.

On examination they do not afford any trace of oxygen. No ready means were applicable for ascertaining the quantity of gas given off, but is incredibly great, as the surface presents the appearance of ebullition, and on stirring the bottom with a stick, the supply is so much increased, that a large test bottle may be filled in a few seconds. The temperature of the water in June, was 45°, the air at the same time was 82°.

These waters as has been stated, escape from a fissure in the Seneca limestone, which is every where broken by a series of faults produced as Mr. Hall believes it probable by the soft gypseous rocks below. In the State survey, Mr. Hall alludes to this spring as the only one in the State found in this geological position; others being near the junction of transition with primitive or metamorphic rocks; and refers to Daubeny's hypothesis, that the production of nitrogen is due to the proximity of melted or highly heat-

Digitized by Google

ed materials, as a probable proof that the faults have arisen from igneous or subterranean action.

This last position is hardly tenable, as in the immediate proximity, there are no evidences of upheaval, except the bending of the shales and Tully limestone, visible on the banks of the lakes; but as the cause which has produced the latter, has long since ceased, it can have little connection with the phenomena at Canoga.

It is probable that the hollow and loose character of the gypseous rock, underlying the limestone, has more to do with the production of the spring and the evolution of the gas than is generally supposed. It is a well known fact, wherever any of these shales are exposed to the air, crystals of sulphate of lime will form, owing to the pyrites of the iron becoming decomposed; its sulphur taking oxygen from the air to form the sulphuric acid, and the iron taking oxygen to replace the sulphur; the acid when formed uniting with the lime in the stone and crystalizing as gypsum. The oxygen being taken from the air leaves its other element nitrogen uncombined and it escapes freely; but if this were carried on in confined positions, as in cavities in the solid rock, the nitrogen could not escape except through such fissures as might accidentally exist. Wherever the rock contains pyrites, there much gypsum will be formed, and it is possible that the large masses of gypsum have been so formed; if so, the quantity of air necessary to supply the needful oxygen must have been great indeed, and the quantity of nitrogen correspondingly great, and sufficient to produce larger evolutions of gas than occurs at Canoga. The water of the spring is possibly supplied by the soakage of the waters on the gypseous ground north of Seneca Falls, which passing along the slope of the strata southward enters those caverns in the rocks, where remaining for some short time, it acquires the steady temperature of that underground position, approaching very near the mean temperature of the year, which in this latitude would be about fifty feet below the surface: passing through the cavities where these chemical changes have been going on, it forces its way through the fissures carrying with it mechanically the free nitrogen, arising from the decomposed atmosphere; the water is placed in the condition of a fluid in a syphon, the long leg being the sloping stratum, and the short leg the fissure, hence it is delivered upward with such force. The water does not contain more mineral matter than sixteen grains to the pint, which consists of sulphate of lime and chlorides of calcium and sodium.

There are no springs in the county of Seneca, which can be traced to volcanic action. The springs which contain sulphuretted hydrogen are those which have traveled through beds of rock containing iron pyrites; this

Digitized by Google

mineral decomposing without access of air produces oxide of iron and sulphuretted hydrogen, the latter gas escaping through the water gives it the sulphuretted odor. There are several such springs rising out of the Onondaga group of rocks, and especially from the shale beds. The Genesee slate region is the most productive of such springs.

Almost all the spring water in the town of Tyre is sulphuretted; other instances are found, in various localities; one exists on the farm of Mr. Van Loo, in lot 54, town of Lodi; another on lot 6, at Seneca Falls—this spring belongs to Mr. Bascom, who is about to erect a neat edifice over it.

Sometimes the oxide of iron becomes converted into sulphate of iron, which then dissolves in the water, and renders it chalybeate. Such is the condition of a spring on lot 69, in Covert, which is also sulphuretted; and also of a spring near the residence of Mr. Daniel Young, on lot 21, in Tyre. These springs are ferruginous, depositing an ochrey layer along their banks.

The springs which pass over and through the Onondaga group become impregnated with gypsum, and the salts arising from the decomposition of the gypseous shales; such is the spring at Dublin, in the town of Junius, which is not sulphuretted. An analysis of this spring exhibited the following result:

Specific gravity, 1015—*inodorous.*

One pint of water yielded 32 grains of solid matter, viz:

Sulphate of lime,	13·60
do magnesia,	18
Protoxide of iron,	·24
Chloride magnesium,	·16
	32·00 grains.

This spring is remarkable for being sensibly acid to litmus paper, and having the power of curdling milk.*

A spring similar to the foregoing, exists on lot 42, in Junius, on the farm of Mr. Southwick; the deposit of ochre is considerable, and the taste of the water is bitter.

Springs passing through beds of limestone rock dissolve this mineral, and

* The acidity of the spring is due to the small quantity of free sulphuric acid, which may be supplied by the tendency of the protoxide of iron to become liberated and peroxodized; I do not believe it to be due to the presence of sulphuric acid in an uncombined state, for such is only found in neighborhoods of existing active volcanoes, where it is formed; in this place, from the tufa being discolored by iron, the acid has evidently been liberated. I am inclined to think that this is the true explanation of similar acid springs in the Onondaga group, although Dr. Beck seems inclined to a different opinion.—Thomas Antisell.

Digitized by Google

deposit it again on exposure, forming deposits sometimes hard, resembling stalactites, more frequently in the condition of soft marly powder, or incrustations (tufa) on pieces of dead vegetable matter; of the former, an example may be seen in the spring which pours out on the south side of Seneca river, a few rods below the village of Seneca Falls; the deposit being somewhat ochrey, gives it a ribboned or agate appearance. In the town of Tyre, there are several such springs, of lesser note.

Of the deposit of lime in the second form, instances are abundant. One of the best is on the farm of Mr. A. Dunlap, Jr., near Ovid, where the tufarous deposit occurs in the stream, and the whole ground around is underlaid with a thick coating of marl.

The spring at Mr. Van Loo's, on lot 54, in Lodi, before alluded to, is remarkable for the escape of bubbles of gas at intervals, and preceded by a low gurgling noise; the gas is given off in large quantity; a test glass was filled in three minutes. It burns with a pale flame, and is wholly composed of a light carburetted hydrogen, or the gas of the marshes; it contains no sulphuretted hydrogen; the pools beside the well, on being stirred, give off the gas plentifully, and no doubt it streams up through the clay, its appearance in the water being accidental. This gas arises from the decomposition of the vegetable matter in the shale below, one of the results of which is, the formation of marsh gas.

On the lot No. 58, in the town of Lodi, bitumen escapes with the water out of the shale. This mineral also arises from the vegetable matter or coal in the shale being destroyed. The decay is a process analogous to what heat produces on coal in a gas retort—it separates the coal into an inflammable gas, (carburetted hydrogen,) and an inflammable liquid, (tar.) On the slate it is decomposed into marsh gas, and bitumen, or Seneca oil, as it is sometimes called, from its being gathered off the lake.

There is a spring in Lodi, on lot 54, which is remarkable only for the large volume of water discharged from it. The basin is about six feet in diameter, and the stream which flows from it would fill a bore of seven inches diameter. Its velocity is about three and a half miles per hour, having a power, from its position, to move much useful machinery. At present it is unoccupied and idle.

Digitized by Google

Drift Deposits.

In every part of the northern hemisphere above the latitude of forty degrees, wherever examined, there is a great amount of proof that a large body of water moved over the face of the lands, then wholly or in great part submerged.

In this state the current flowed rapidly in a south-easterly direction, and bore along upon its bosom whatever materials it could take from the rocks over which it had passed, and deposited them very far south of the localities whence they were derived.

Whether this diluvial action was sufficient to excavate the deep channels of the lakes which border this county, and, to produce grooved lines* on the surfaces of the exposed rock, there is not sufficient evidence to say, as far as this county is concerned. In part of the British Isles, the furrows on the rocks are in the same line as the deposition of the drift now alluded to, and may be considered as cotemporaneous in origin, and indicating the course of the current.

The materials carried by the waters are of two kinds, viz:

1. Boulders or large blocks of stones generally rounded and found lying on and imbedded in the clay.

2. Beds of sand, and clay or of gravel, the fragments are rounded, of various materials, and different degrees of fineness.

The boulder deposit in this county is very abundant in the north, sparse in the middle towns, and very deficient in the south. One reason for this may be that such large masses although transported in deep water and therefore with great momentum in travelling along the ocean bottom, must in this county have been brought up an inclined plane, going south: their motion would then be impeded by any moderate obstacle; perhaps another reason is that those rocks being deposited in the north, the supply which might be had by the action of the current on the beds in the middle and south would be trifling, as with the exception of the limestone no other rock would afford them; the shales of the southern towns could not produce a boulder.

In the northern towns these stones are almost all derived from primary rocks, and are the only instances of crystalline rocks in the county.

The larger masses are uniformly granite, (chiefly white) as occur in Junius, where they have been removed from the surface, and meet the plow occasionally.

* The Grooved lines have not been examined in this county, there are no fresh exposures of rock sufficient to afford examination, and it is desirable in all future openings of quarries that such examinations should be made.

Digitized by Google

On Mr. Braden's farm several blocks of this kind have been raised: one of these was about four feet in diameter; smaller stones of flesh-colored granite and gneiss have been removed from the central lots of Junius. On lot 29 the larger stones are chiefly granite and sandstone, (red) and the smaller stones are Graywacke slate. In lot No, 1, on the road side, lies a large boulder N. E. and S. W.

In Tyre, granite boulders of a large size are frequently met with; a few smaller consist of sienite, granite with red felspar, and red sandstone. Cobble stones of greenstone porphyry are abundant.

These large masses are almost confined to these towns, for in Waterloo and Seneca Falls, the larger boulders are rare, appearing at the sides of the gravel hills occasionally, but seldom constituting the surface stone.

In the town of Fayette, although blocks of large dimensions do here and there present themselves, yet it is probable they were included in the mass of gravel and sand. On the lake margins, they have been washed out of the ridges; on the lots south of the Seneca river they are chiefly of gneiss and granite; large blocks of hornblende and actymolite are accompanied by rolled pebbles of greenstone, sandstone, sienite, and limestone. In the south of the town limestone appears as a drift rock, and continues to increase through the towns of Varick and Romulus. This appears to be more especially true of the eastern side. The primary rocks never wholly disappear: granite is found on almost every lot in Romulus and Ovid, much more sparingly in Lodi and Covert. In these latter towns, they are present in smaller masses, as is also, occasional fragments of hornblende, greenstone and actymolite.

In the southern towns the limestone is not so abundant a boulder as in Romulus and Varick, but is a very common handstone in the gravel hills.

The limestone found as boulders in the middle and south, appear to be similar to the Waterloo stones, and some of the larger masses of the Tully limestone. South of the county this stone has been drifted to a great distance, having been probably torn up from the bed of the lakes by the force of the currents.

There does not appear to be any uniformity in the line of deposit of these boulders, nor does the eye trace a given course with any distinctness. In other words they do not imply their being grounded out of ice deposits, or by glacial action. Perhaps, however, the cultivation of the soil by removing them, may divest this opinion of any value.

The ridges of gravel and sand, and of clay, appear to have been carried by a similar action, and at the same time as the larger stones where the

Digitized by Google

small stones which are to be found in them are, to a great extent, of a similar character, and probably from the same localities.

In the north-west of Junius, these hills are very numerous, set closely together, and have a direction pointing S. SE. In Tyre the same direction prevails, where they are more prevalent in the lots forming the middle and north-west portion of the town; toward the southern portion they spread out and the surface is flattened.

In Seneca Falls they preserve the same direction, both on the north and south side of the river. In the western lots of Waterloo, the direction appears to have inclined more to the eastward: the lots on the river have their ridges well developed, but somewhat spread out and flattened.

In Fayette these hills of sand and gravel lose the isolated and distinct character which in the northern towns were well defined; they are here considerably flattened out, as might be supposed to occur, when the drift, arriving in water somewhat shallower, met with obstructions on the surface of land sloping upward toward the south; the tops of the hills have less slope, and the northerly and southerly direction is less marked, if we except the margins of each lake, where the ridges are quite distinct and formed of gravel and stiff clay, the former being composed to a great extent of limestones. They chiefly accumulate on the bluff edge or the north side of the ridges of shale which overspread this town.

In Varick and Romulus, there are fewer evidences of these hills, yet the drift can be traced along the towns deposited in almost an even layer, with more quietness and somewhat finer materials.

These had more time and a better opportunity to settle down, and in these towns, and those farther south, beds of gravel disposed evenly along the surface of the shales, and constituting receptacles or basins for the rain water to sink into, are common: in some places, as the southern side of a small hill, a bed of fine sand will be found to exist, occasionally the latter is spread horizontally as a layer, beneath a few feet of soil.

In the southern part of Romulus, the sand appears to have been distributed more abundantly on each lake shore, than on the central lots, and with a few exceptions this is true of the southern towns.

The western lots of Lodi are much more sandy than those in the middle of the town, or adjoining Covert.

The greater abundance of limestone in the pebbles of drift, as well as in the larger boulders in the southern towns, contributes to increase the amount of that mineral in the soil, giving it as in the south of Romulus a marly character.

There is a less uniformity in the character of the drift over a given space

Digitized by Google

in Waterloo and Seneca Falls, than in other towns of this county; thus in Seneca Falls, on lots 73, 84 and 85, fine grey sand is found under almost all the hills. This occurs on Mr. Crowell's farm in very fine layers, the sand possessing a slight buff tint. It is drawn into Waterloo for building purposes and is sold at twenty-five cents per load. On Mr. Austen's farm in this neighborhood, a finer sand than the above occurs, but the pit is nearly exhausted.

In Waterloo, many of the lots on the north side of Seneca River, appear to be a wet alluvium. The village lot and numbers 97 and 98 are of this character: in 78, 89 and 91, the soil is chiefly sand; while lot 90 is a wet alluvium mixed with muck.

The depth at which these deposits of drift cover the surface varies; accumulating in some places above fifty feet, while in others, the rock is reached in one to two feet. The northern towns, however, seem to have a much deeper deposit than those in the middle and south.

The following table may be interesting as giving the depths to which wells have been sunk in the various places indicated. With few exceptions the sinking has been continued until the rock was reached, and the materials through which the boring was carried, are noted.

Towns.	Localities.	Depth in feet	Observations.
Junius,	Lots 16, 17, 18,	25 to 50,	Clay 3 feet, gravel 2 feet, and sand 20 feet and over.
do	Mr. Sutherland, lot 56,	30,	
do	Jno. Bradin, lots 2, 5,	40,	26 feet of clay, 14 feet blue clay.
Tyre,	D. Young, lot 21,	25,	18 feet clay, 3 feet sand, 4 feet gravel.
Waterloo,	Average depth,	25,	
Seneca Falls,	C. D. Mynderse, lot 85,	18,	On the ridge top.
do	do do	32,	Off the ridge, no rock bottom.
Fayette,	A. Lerch, lot 31,	22,	Slate bottom.
do	A. Rorison, lot 15,	25,	9 feet clay, and 16 feet gravel.
do	Wm. Marshall, lot 12,	6,	Thin bed of gravel at bottom.
do	Jer. Opdyke, lot 30,	12 to 20,	
Varick,	Lots 4, 5, 6, 7,	9,	The average. Slate bottom.
Romulus,	J. D. Coe, lots 70, 71,	3 to 7,	
do	Wm. Martin, lots 82, 76,	2 to 4,	
do	Th. Johnson, lots 89, 90,	3 to 5,	
Ovid,	J. Covert, lot 32,	43,	15 feet marly clay, 12 feet gravel, and 16 feet sand.
Covert,	Col. Pratt,	5 to 7,	Shale and flag stone.
Lodi,	Dr. J. L. Eastman, lot 37,		4 feet clay, gravel below.

From the foregoing it is evident that the clay and soil which cover the county are mainly derived from the drift deposit, as, with the exception of the Seneca limestone, and the Marcellus shale, the other beds are covered so deeply as to have little influence on the soil. The amount and nature of that influence will be mentioned when treating of soils.

The hill deposits generally present their greatest slope to the south, and their bluff end, or shoulder, to the north. The eastern slope is more abrupt than the western in the majority of cases, from which it is inferred that the

Digitized by Google

current which bore them came from the north by one point east, which is the general line of their direction.

The deposit of drift in the northern towns is especially derived from some locality farther north. In the southern towns, it appears to be made up, in a great degree, of materials derived from the centre and south part of the county itself. The great abundance of limestone gravel may possibly have been derived from the limestones over which the water passed.

Viewing the drift as a deposit from which the soils of the county are chiefly derived, it becomes a consideration of importance; but viewing it simply as a deposit of drift, whether of clay, gravel, or boulders, it is of very small amount in the eyes of those who are acquainted with a well characterized drift region.

In two instances masses of timber have been found as low as thirty-eight feet below the surface, imbedded in the sand and gravel. The wood was apparently white ash, and in good preservation.

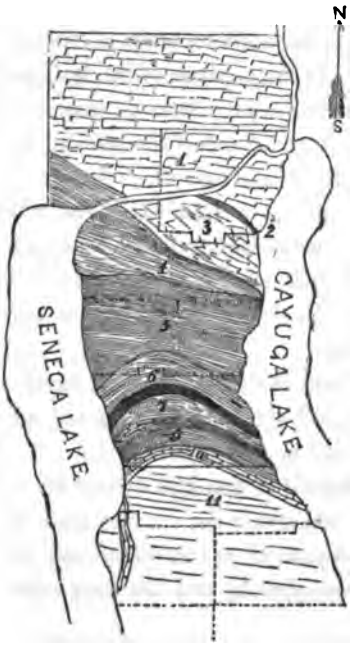
The period of the deposit of this drift is very far subsequent to that of the bed of rocks upon which they lie. A long lapse of time must have intervened sufficient to deposit all the limestone, and coal formations in the adjoining state of Pennsylvania, and the later secondary rocks of New-Jersey.

The tertiary beds were then deposited, which are mostly fine clays, such as those of Lake Champlain, and of the Mohawk valley.

Whether these beds may be classed among the latest of the tertiary deposits, or whether they belong to the post tertiary deposits, or whether they belong to the past tertiary period is doubtful. Some of the British sands and gravel can be referred to the post pliacene period of Sir C. Lyell; but there is little evidence in this region and its clays to justify a like conclusion in regard to them.

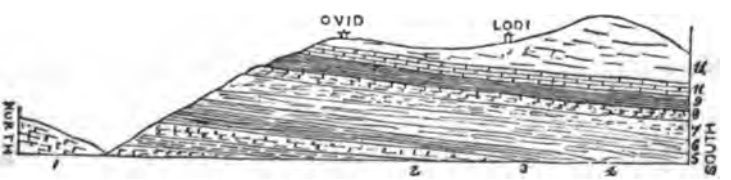
Digitized by Google

Geological Map of the County of Seneca.



1. Onondaga salt group.
2. Water lime.
3. Seneca limestone.
4. Marcellus shale.
5. } Hamilton group, olive,
6. } dark blue, and Lud-
7. } lowville shales.
8. Encrinal limestone.
9. Moscow shales.
10. Tully limestone.
11. Genesee slate.

Geological section of Seneca county from north to south.



1. Onondaga salt group.
2. Water lime.
3. Seneca limestone.
4. Marcellus shale.
5. 5, 6, and 7, Hamilton group.
6. } Hamilton group, olive, dark blue,
7. } and Ludlowville slates.
8. Encrinal limestone.
9. Moscow shale.
10. Tully limestone.
11. Genesee slate.

Digitized by Google

AGRICULTURE.

The husbandry of the State of New-York, as pursued from the earliest period of settlement, had for its object the possession of the largest product, with the application of the least labor and capital, and without reference to a continuance of *the fertility* of the soil. No system of cultivation existed, no calculation as to income or expenditure seemed ever needful, for the farmer needed to labor moderately in order to enjoy plenteously the rich and bountiful gifts of the virgin soil.

The facility for procuring new lands at an almost nominal price, the soil of which *then* contained every element for the perfect growth and maturity of every useful plant, rendered the common exhausting system generally prevalent, for, where land was good and low in cost, it was deemed cheaper to relinquish a worn or exhausted farm, and purchase new land than undertake to manure and restore fertility to the old homestead.

Before the year 1830, it was an almost universal practice to apply a slight culture to a wide extent of acres, thereby to derive a greater profit than could be obtained from a better and more concentrated cultivation. The cause for this imperfect mode was, the high price of labor, and the low price of land. Continued grain crops were taken, and for many successive years from the same fields, nor has this mischievous practice been wholly discontinued to this day.

The diminished and diminishing products of the early cultivated farms, attracted the attention of General Washington, Thomas Jefferson, and other land proprietors who, with enlightened views anticipated the effect and probable inconvenience which must follow the exhausting method of cultivation, and efforts to counteract the error, were contemplated as early as the year 1793.

The current of emigration to western New-York having commenced, the tendency was to enhance the value of labor in the older settlements, and the deterioration of the soil diminished the comforts of the farmer. At the same time the cities on the seaboard increased their population with unexampled rapidity. This new population, drawn from all parts of Europe, comprised men generally well informed, able and industrious, and demanded greater exertions from the agriculturists for an adequate supply of their usual products. The opportune demand for the products of the farmers' industry, then as now, the great leading and important feature of the nation's wealth, stimulated the owners of long cultivated farms, into anxious researches for remedies to restore their soils to a remunerating power.

Digitized by Google

Europe had long suffered under the same exhausting system, and her people suffering in want, badly clothed and worse fed, sought with eagerness the rich lands of this country, unincumbered with taxes and imposts, a wide and free field for honest toil and useful industry. England, Scotland, Ireland, and the nations of the continent poured forth their thousands to people and cultivate the new lands of the United States. It was the immense extent of these movements which called loudly for greater exertion among the governments of Europe to proffer aid and comfort to their people. These influences operating alike, though in different degrees on the eastern and western continents, opened to the political economist and statesman new fields for investigation. Science found a new path for research and for the application of principle.

Agriculture, which hitherto had been practiced as an art, became an ennobling science, and mind with intellect became devoted to the elevation of this first and most important occupation of mankind. In the year 1813, Sir Humphrey Davy published his Elements of Agricultural Chemistry. He was preceded by Robert Bakewell, Arthur Young, and Lord Somerville, and followed by Sinclair and Loudon, men who have exhibited in Great Britain an amount of patient experimental investigation and knowledge which elevated husbandry to a high point of production and perfection.

Germany was roused to exertion; institutions for the instruction of youth in the science and art of agriculture were formed, and are successfully maintained. Investigations, experiments and sound deductions, thus called for, and spread before the agricultural world, have in a degree dissipated false theories, idle prejudices, and mysticisms, which for ages, rendered the occupation of the farmer hazardous, laborious, less dignified and less desirable than other vocations of life. They have proved that, as an art, agriculture is the basis of all other arts, not only the most ancient and universal, but requiring for its perfect practice as extensive stores of knowledge as any profession known to man.

The importance of science to promote and increase the products of the soil, is appreciated by the people of New-York, as highly, as by the people of Europe. Capable of comprehending the principles of science, as well as their right application, public opinion has been strongly expressed in favor of the establishment of institutions, where the physical laws which govern the formation of vegetable and animal life, from inorganic matter, shall be explained and taught. The schools of England, Germany and France, present models for examination and improvement.

In the State of New-York, the several counties have clustered around the State Agricultural Society with signal advantage, receiving and contribu-

Digitized by Google

ting knowledge for the benefit of all; but the important and essential basis for a sound agricultural education, by means of a well endowed college is wanting, to develop the spirit, genius and power of the American cultivator.

Admitting a general deficiency of knowledge of the laws which govern matter in connection with agriculture, and deploring the absence of means for the concentration and distribution of agricultural science; the farmers of the county of Seneca, are content with the exertions of the past, and indulging hope for the future, they look forward with cheerful patience and confident belief, that their sons will obtain and possess advantages of high instruction hitherto denied to themselves.

Allusion has been made to the practice of cultivating large farms imperfectly, rather than bestowing the same amount of labor on a less number of acres, and by more perfect action obtain a larger product; and the cause was explained; but an evil exists nearly allied to this position, working a more certain loss, and that is the possession of a greater number of acres than the proprietor can cultivate, by reason of want of sufficient capital.

This evil does not seem to exist to any extent in this county, as the whole area comprises 197,500 acres, and is divided into 2,349 farms, giving an average of eighty-four acres to each cultivator. The exact distribution of the soil is made evident by the subjoined table, exhibiting the number and size of the farms in each town, and the aggregate number of each in the county.

The subject is worthy of attention because a consolidation of landed property is supposed to be increasing within a few years, tending to diminish population, and thereby to lessen the wealth of the county.

	Covert.	Fayette.	Junius.	Lodi.	Ovid.	Romulus.	Seneca Falls.	Tyre.	Varick.	Waterloo.	Total.
25 acres and less, ..	54	91	38	41	43	63	49	56	72	57	564
25 to 50 acres,....	40	60	38	39	29	33	22	36	36	43	376
50 to 100 do	79	131	59	70	51	66	48	72	88	36	700
100 to 150 do	40	80	40	50	35	35	29	22	37	24	392
150 to 200 do	14	27	15	16	21	28	17	13	11	8	170
200 to 250 do	4	10	4	7	9	12	3	8	6	3	67
250 to 300 do	4	5	2	4	3	8	1	3	5	5	40
300 to 350 do	1	4	1	2	2	2	4	1	2	....	19
350 to 400 do	1	1	2	1	1	2	....	....	....	2	10
400 to 450 do	1	....	....	....	....	....	....	....	....	1	2
450 to 500 do	....	1	....	1	....	....	....	....	....	....	2
500 to 550 do	....	....	....	....	1	....	....	....	....	....	1
550 to 600 do	....	....	....	....	....	1	1	....	1	....	3
600 to 650 do	....	....	....	....	....	....	....	....	1	....	1
650 to 700 do	....	....	....	....	....	....	....	....	....	....	....
700 to 750 do	....	....	....	....	....	1	....	....	....	....	1
750 to 800 do	....	....	....	....	....	....	....	....	....	....	....
800 to 850 do	....	....	....	....	....	1	....	....	....	....	1
850 to 900 do	....	....	....	....	....	....	....	1	....	....	1
Total No. of farms,..	238	410	199	231	195	253	174	212	258	179	2,349
Acres in each town,..	19,200	23,850	16,500	21,600	19,200	21,500	14,550	18,600	19,500	13,000	197,500

Digitized by Google

The number of	acres improved and cultivated is,.....	150,990
do	acres of woodland,.....	40,510
do	acres of marsh and swamp, ...	6,000
		197,500

The aggregate number of acres corresponds with the report of the board of supervisors.

Soils.

It has been remarked by men of information, that the agricultural community of the United States have seemed willing to forego the benefits of knowledge, and from this assumption they have inferred a reluctance or indifference to the establishment of institutions for the promotion of the agricultural art and science. The remark is not warranted by the action of the farmers of the county of Seneca, and is doubtless equally inapplicable to many counties in the State of New-York. In the county now under survey, every town has reason to rejoice in the intelligence of its farming community, and point to the many individuals who have caused the soils of their several farms to be analyzed, the quantity and quality of the earth's elements to be measured and understood, enabling them to avoid the theories of the empiric, or the errors of blindfold experiment.

The farming community has no cause for self-reproach, because of the slow advance made by science for the promotion of agriculture.

The farmer of 1850, who has not examined the subject, may feel surprised when he is informed that no means existed a few centuries back, by which knowledge could readily be diffused. Linen paper was not in general use until about four hundred years ago, neither was the art of printing books known until the year 1450. Though the profound ignorance of the dark ages was passing away, reading and writing were confined to the cloisters. The king of France in 1300, could not write his name. In 1400 it was esteemed a valuable characteristic of an English gentleman that he comprehended reading and writing. During the seventeenth century the exact sciences advanced rapidly, and literature had many friends and admirers. It may be said, however, that until the present age, men were more devoted to deep and abstruse studies, whereas *now* the understanding is more generally informed or instructed. Literature and science are better diffused, and though the scholar is not as deeply read, yet he is more able, because he is more useful.

The science from which the agriculturist could best obtain substantial aid is chemistry, a science which was long obscured by dreams of astrologers,

Digitized by Google

and idle cupidity, fostered by the fables of the philosopher's stone and absurdities akin to knavery and folly.

Chemistry did not reach the rank of science until 1787, nor were the researches of the chemist rendered useful to the farmer, until the publication of Sir Humphrey Davy's works in 1813; it was left for the present age to apply natural substances to new uses, and increase the comforts and enjoyments of man; it was left for the present age to ascertain by research, the composition of the earth and air, their elements and uses, to investigate and unfold the nature, growth, and perfection of plants; the food necessary for their nourishment, and their best application for the support of animal life.

This science has proved to the cultivator, that his grain plants and grasses derive support from the atmosphere and from the soil; it has proved also that plants have various constituents, such as potash, lime, &c., without which in due proportions they cannot mature; a knowledge of these facts secures to the farmer of this age, advantages far beyond any possessed by the farmers fifty years ago.

In the previous portion of this work, it has been shown, that the surface of the rocks which underlie the soils of this county, has been at some period swept by the currents flowing over them. Scratched and grooved by the solid matters carried along by the rushing waters, which meeting with obstructions, deposited masses of sand and gravel, either as an even carpet, or in hillocks as before described, covering in almost every town, the appearance of the rock below and filling the angles formed by elevated edges of the strata: it has given that smoothness and undulating roundness to the scenery of the county which is so pleasing to the eye of the agriculturist.

This deposit of sand and gravel coming from a northerly direction, must partake of the nature of the rock in that section of the country which lies between Seneca county and lake Ontario. The rock formations are chiefly of the gypseous group, (known in the State survey as the Onondaga salt group with its accompanying shales and limestones,) which occupy Wayne, Cayuga, and Onondaga counties.

The masses of stone which were broken off and swept away from these counties being rolled together and ground into fine particles by the action of agitated waters, were left on the surface of this and the adjoining counties in the shape of sand and clay, with gravel as it is now met with; the salmon colored shale of Wayne contributes to a large portion of the soil of Seneca, especially in its northern towns. From this it is reasonably inferred that the soil of Seneca county has not been derived from the wear or

Digitized by Google

disintegration of its own rocks, but has its origin in the rocks of the Ontario shores.

It is an admitted fact that all soils are formed by the decomposition and crumbling of rocks; and it is asserted that if the composition of the rocks of a country were known, it would be possible to know the composition of the soil of that locality. This would be true if the soil was never removed from the spot where it was formed; but it has been shown how the rocks of this region have been subjected to the action of water, which has denuded them entirely and supplied their surfaces with soil from distant localities, so that it would be more correct to infer, that if the composition of the distant rocks were known, a more thorough idea of the county soils could be had.

The clays and sands having been deposited, are not now in their original condition. From the moment they emerged above the water level, and became dry land, decomposition and chemical combination took place among the different minerals, breaking them and rearranging them into other and more stable formations. The atmosphere assisted in this action on the surface, and the rains sinking carried down the change into the interior. The sun's heat and the winter's frosts alternately affected them, and in the lapse of time, the laboratory of nature so separated the alkaline and earthy salts from the siliceous matters, that vegetation could be carried on. The lichen and the moss preceded the grasses and the sedge, and these yielded to shrubs and forest trees, until the whole surface was covered with organic life. These annually dying, partly or wholly, and falling to the earth, acted in their process of decay as a ferment to the mineral matter of the earth, and gave to its particles a further action of change and decomposition.

Thus the decomposition of the soil favors vegetation, and the decomposition of the vegetable favors the further alteration in the soil.

When vegetable matters decay they always act as decomposing materials, producing acids, which unite with potash, soda, lime, magnesia, oxides of iron and manganese, separating these elements from the combinations with silica in which they existed as minerals. Of these acids the most powerful and the most common is carbonic acid, whose effect is probably most usefully displayed by its setting free the potash out of its mineral combination.

These facts are set forth for the purpose of suggesting for consideration and for practice the avoidance of naked fallows, for if vegetation thus materially aids in decomposing a soil, is it not injurious to deprive it for a season of the increased stimulus to decomposition, which a green crop turned under would have added to the soil.

The soils of this county being of drift and diluvial origin, the wearing

Digitized by Google

away of gypseous slates and secondary sandstones and shales, the materials transported a considerable distance with much sifting action, it is evident that its chemical composition throughout might be described as that which would arise from those comminuted rocks. Such would have been the case were the depositing force of the waters uniform over the whole county, and were the beds of rock such as were insusceptible of ready decay. But here neither of these conditions have existed.

The nature of the diluvial action, and its direction have been described under the head of geology, and it is here alluded to only to point out how far the agitation of drifts is capable of altering the character of soils. The effect of the current upon the Seneca county soils has been to sift them, and thus mechanically to alter the physical character of the diluvium in different places, producing accumulations of light sand in some localities, and of heavy clay in others. Thus sand and gravel constitute much of the natural soil of the northern towns of Junius, Tyre, and Waterloo, and as the current swept southerly, the finer particles of clay and moulds were deposited on the middle and southern towns, occupying the more elevated portions of the county, while the lake shores received generally a more sandy deposit.

These sands and clays were not originally distinct at their source; they were derived from one homogeneous mass, which was roughly analysed as it were, by the moving floods. This seems to be clearly proved by the fact that the insoluble ash, after digestion in acid, and by ignition, leaves the same flesh colored and mineral composition, whether it be derived from clay or sand.

The sandy soils of Junius and Tyre, with the northern portions of Seneca Falls and Waterloo, appear to have undergone no change since deposition, save only the slight alteration which recent cultivation has caused; certainly no change has been effected by the underlying rocks; they are, for the most part, too deeply situated to be easily affected by decomposing agents.

Their general formula might be expressed as a soil containing

Vegetable matter,	4
Alumina,	3
Saline matters soluble in water,	0·50
Residuum from sand dried and burned,	90
Lime, magnesia, &c.,	0·50

The ash of the sand is a flesh colored residue, closely resembling powdered sandstone.

Many of the sandy soils of Fayette, Lodi and Covert, have a similar common character, and may, with the more northern, be classed as gypseous drift sand but little altered.

Digitized by Google

The proprietors of farms where these soils prevail, should carefully keep up the amount of vegetable matter, to the proportion of five per cent. or more, by frequent application of manure, and occasionally moderate or small dressings of lime.

The saline matter of these soils is chiefly sulphate of lime, (plaster of Paris,) and chloride of sodium, (common salt.) Both these minerals exist largely in the group of rocks from which the drift was derived, and might therefore be reasonably predicated to exist; but the quantity in some soils, especially of plaster, is so great as to justify the belief that an additional source of supply must exist. This supply is found in the springs, which, rising from the Onondaga salt group, escaping into the drift soil by the fissures and cracks in the strata, have become charged almost to saturation with common salt, plaster, and Epsom salt, (sulphate of magnesia,) which these rocks contain in great quantity. These salts are deposited throughout the soil by the waters, until, in many instances, of which Dublin, in Junius, affords an example, a mineral spring appears at the surface.

The clay lands of the middle and southern portions of the county contain less vegetable matter than the sands above named, probably because they have been longer under cultivation, and due care has not been observed to return this essential material to the soil. The clay soils, in most instances, contain less alkaline salts. The earthy matters of magnesia and lime are rarely entirely absent. Magnesia is an abundant element in the soils of the northern towns; and those of a sandy character, in which it exists apparently as a sulphate, deposited as already described. Not so, however, with lime. It exists in a small proportion in the soils of this county. It frequently does not exceed more than a quarter of one per cent.; in a few cases it averages one per cent.; in one instance only, on the farm of Mr. Enoch Chamberlain, of Fayette, it reached $1\frac{48}{100}$ per cent., a quantity remarkably small, when it is remembered that this farm lies over a bed of limestone,* and upon which lime had been from time to time applied.

This instance affords a good illustration that the surface soil is slightly if at all affected by the rock which underlies it, and is not produced by its decomposition.

So is it likewise with the stiff clays in the middle towns; they rest on the beds of slate, (Marcellus shale,) which contain a considerable amount of lime, yet the surface soils afford rarely more than three-fourths of one per cent. of lime. Hence it will be evident to every farm proprietor where these clays prevail, that a strong necessity exists for the application of this mineral, both in the caustic and mild condition, the use of the latter is indi-

* The limestone on this farm produces ninety per cent of carbonate of lime.

Digitized by Google

cated wnerever the quantity of vegetable matter is small; happily for the county, there are numerous beds of marl scattered over the several towns, affording a ready supply of lime in a mild state.*

The proportion of lime is rather greater in the soils of the southern towns, but in none sufficient to render a further addition unnecessary.

When European, and especially British soils are compared with those of this county, the difference in the amount of lime strikes the eye at once.

There, many stiff clays contain from three to five per cent. of lime, and ordinary mould lying upon the calcareous beds contain as much as ten per cent. This proportion and even greater is found in drift clays, sands and gravel, independent of any decay of underlying rock. This disproportion is the more remarkable, as it is not peculiar or confined to New-York soils only, but to those of the whole North American continent, arising probably from the geological circumstances which prevented a deposit of calcareous matter among the same co-eval beds of rocks, similar to that which took place in Europe. Whether this be so or not, the fact is certain, and leads naturally to the consideration how far the small quantity of lime in the soil sustains the crops, and how far it is necessary to add lime to further that end, and to what extent it is possible for the farmer to be misled by reliance on European suggestions.

In many of the northern parts of this county the amount of lime in the soil is under $\frac{3}{1000}$; in a few instances it amounts to six parts in one thousand; admitting the former to be the prevalent proportion, the quantity of lime present in the acre of six inches deep, and allowing the soil to be a sand weighing about ninety pounds to each cubic foot, would amount to 5,200 pounds, or above two and half tons; a quantity far above what plants require if we depend upon the accuracy of English analysis of crops, as a guide to the constitution of those of Seneca county or of the State, for by them it appears that a rotation of two grain crops, a root crop, and grass pasture requires only one hundred and seventy pounds of lime, or three hundred pounds of carbonate, the condition in which it is found in the earth; so that as far as lime sufficient for supplying the wants of the crops is concerned, there is enough in any of the soils which have not been exhausted by over cultivation.

It has been found difficult to raise remunerative crops of grain in England upon soils containing so small an amount of this mineral even as the largest or highest per centage of any soil in this county; and it may be that so great a difference in the climates of the two countries requires this element in large proportion in the one, and dispenses with it in the other.

* The analysis of marls may be found at the close of the work.

Digitized by Google

British soils contain on an average more vegetable matter than the soils of the county of Seneca; their summer is shorter and more moist; consequently the ground is colder and less fitted, so far, to carry out the final process of the plants, the ripening of the ear. Now the chief result of the addition of lime, is the decomposition of the vegetable matter and the formation of carbonic acid, by this latter process a large degree of heat is given out, which diffused throughout the soil must tend to raise its temperature, and act as an aid to solar heat in urging the plant to maturity. In this case the addition of lime may serve a two fold purpose, acting as food and fuel. Thus owing to a smaller amount of solar influence in Great Britain, the necessity for a larger proportion of organic matter and of lime to decompose it seems to become imperative. No such necessity exists here, the sun's rays in summer are continually exerted in raising the temperature of the soil, and unceasingly decomposing vegetable matter as long as any moisture exists in the soil; so that, soil if left undisturbed and unprotected by woods for a series of years, would be effectually deprived of every portion of vegetable matter, and reduced to the condition of a desert. In this country the sun's rays are sufficient to decompose vegetable matter producing carbonic acid without the intervention of lime, and lime is not required to be added to the soil here in the large quantities which are used in England and by some farmers in this country, because there is little or no necessity for forcing the decomposition of vegetable matter.

Supposing the above explanation to be correct, one consideration should press itself upon the notice of every farmer, viz: that as the climate of this county, and of the State, differ greatly from that portion of Europe with which agricultural knowledge is most frequently exchanged, the American farmer must not rely upon conclusions and practices drawn from a different condition of things. He may receive them as evidence of the state and position of agricultural science abroad, but not as applicable to American soil or American climate. In this view he will perceive the necessity for the further study of the climate and productions of his own land, so as to draw his own conclusions from a correct source.

It must not be understood, however, that because there is lime in the Seneca county soils sufficient to supply food to plants, and to decompose vegetable matter, there is therefore a total quantity sufficient for all purposes. Such is not implied nor intended by the foregoing, and it is clearly otherwise from the fact that the addition of small quantities of lime improves the fertility of all the farms in the county.

The addition of lime to soils causes changes to commence and proceed. These changes are many. One more only need be here alluded to—it is

Digitized by Google

the tendency of lime to set free potash and soda in the soil. When lime is brought into contact with a mineral containing either of these alkalies, and carbonic acid being present, slow decomposition ensues, and while the lime takes away the acid element from the alkali, (potash or soda,) and sets it free, the carbonic acid aids by being present, to unite immediately with that alkali, forming a carbonate.

The presence of lime and carbonic acid is, in fact, the great source of the presence of potash uncombined with silica in the soil, and as lime tends to produce carbonic acid in the soil, it may at once be perceived what an important use lime performs. This action of lime must be constantly called into play in the soils of this county, which contain so much soluble saline matter as has been stated, derived from the so readily decomposable gypseous slates or shales. For this reason alone, were there no other, lime is essential to the farms of this county, but it should be added in *small* quantities and frequently repeated.

The absence of phosphoric acid from the soils of this county is remarkable, and seems to call for a careful examination by every farmer, of the soil he cultivates. The importance of this element to the wheat grower is strongly set forth in the address of Professor Norton to the farmers of Seneca in October, 1850. The address is embodied in this work, and is deserving of a most attentive perusal by every farmer.

With a view to induce a more extended inquiry into the nature and uses of phosphates as an element of wheat, and otherwise essential to the agriculturist, it may be here stated, that the immediate origin of phosphoric acid, and phosphates which exist in plants, is in the water which percolates through the ground. Passing through beds of clay and meeting with any traces of phosphates of the alkalies or of the earths, the water dissolves them and thus brings them in contact with the delicate fibrous roots of plants in a condition to be received by them. These minute portions of phosphates found in the clays may be traced up to the parent rocks from which those clays were derived, and there are few rocks which have been examined, that have not yielded such an amount of phosphates as to warrant the belief that such and such only are the true sources of this valuable mineral food. It has been found in the igneous rocks,* or rocks of igneous origin, and it has been detected in the upper beds of slate, in the old red sand stone, in various varieties of carboniferous limestone, and in millstone grit.†

The secondary rocks of this State might be expected to contain it, being analogous in position to the Cirencester and Dudley shales. For this pur-

* Fownes. † Sullivan.

Digitized by Google

pose the Marcellus shale, the Tully limestone, and the Genesee slate, have been examined by Dr. Antisell, and each afforded traces of phosphoric acid; the quantity was too small to be determined.

The primary source, then, of the phosphates, may be assumed to be the rock, out of which the water dissolves them; but the water must be previously charged with carbonic acid, to possess the power of dissolving earthy phosphates and keep them in solution; and upon examination* of water taken from the deep wells in London, in some instances two hundred feet below the surface, they were found to contain both phosphate of lime and phosphate of iron, the water being very alkaline; they were detected also in the water about Cirencester, (England,) and in the Edinburg water.†

It is probable that the presence of phosphates in water, renders the latter so beneficial in irrigation, by depositing these as the water trickles through the soil.

Clay and loam exercise a powerful filtering action on water, depriving it of all its carbonates, and the earthy basis of almost all the other salts present; and although the quantity may appear small, to supply the wants of vegetation, yet when the vast body of water flowing through the ground is considered, the difficulty of conception disappears. Every acre of clay land one foot deep, and weighing twelve hundred tons, contains in that weight four hundred tons of water. Suppose, then, that water contains no more phosphates than the deep well examined by Graham, being 0·77 per cent. in a gallon, it would then contain one-half of a pound of phosphates; but in fact it would contain more, as superficial waters contain more salts than deep waters, even as high as 2·60 per cent. of phosphates,† and this would give to an acre thirteen and a quarter pounds.

The four hundred tons of water, however, never remain long in the acre; it is either evaporated or drained off, giving place to a fresh supply of water, charged with phosphates as before.

On every acre of land there falls, during the five summer months, about two thousand tons of water and three hundred tons of dew. If this body of water contained the proportion of phosphates above mentioned, there would be over ten pounds of phosphates for the supply of the acre; a quantity more than sufficient for an average crop of wheat, as produced in the State of New-York; the quantity of earthy phosphate in twenty-five bushels, being estimated at about eight pounds.

Experiments have been made,‡ showing that one wheat plant will exhale during its life of 172 days, 100,000 grains of water; this, for an acre of growing wheat, supposing the weight to be an average of two tons, would

* Graham. † Voelker. ‡ Lawes.

Digitized by Google

be equa to ten tons of water per day, or 1720 tons during its whole growth Now, at the previous calculation, this amount of water exhaled by the plants, and which had previously carried its salts through the crop, would give up or yield seven and three-quarter pounds of phosphates, or about the proportion estimated above as the supply for an acre.

These remarks on the soils of this county, their elements and amendment, might be extended to a greater length, and perhaps with some advantage. Enough has probably been said to induce a continued inquiry, by those immediately interested, and with a favorable result.

A reference to the analyses of the several farms at the close of this work, will readily show their present condition in regard to the existing proportion of the essential constituents; at the same time indicating the course of management necessary for increased fertility.

Happily the marls of the county afford a large and valuable supply of phosphates,* and in their respective localities ought to be industriously employed.

At distances which involve a heavy expense for the transportation of these valuable minerals, the farmer must depend upon the liquid riches of his cattle and dung heaps, which, if husbanded with care, will be found almost sufficient for the demand.

NOTE.—Samples of the soils of Seneca county will be found at the rooms of the State Agricultural Society, Albany, and the analysis of each will be found in this work.

Principal Crops.

Wheat is the principal crop of the county of Seneca; about thirty-five thousand acres are occupied annually in the production of this important grain, being one-fourth of all the acres devoted to the plow. The crop varies in the amount of its product from 550,000 to 650,000 bushels, as the season may be more or less propitious; the average quantity being now estimated at twenty bushels per acre per annum.

In the year 1840, the wheat crop yielded about 350,500 bushels; in 1845, it was increased to 483,733 bushels; in 1848, by a special return and report to the county Agricultural Society, it had reached 644,960 bushels. The average product per acre, was in

1840, ...	10	bushels.
1845, ...	14	do
1848, ...	20	do
1850, ...	20	do

By a reference to the county societies transactions for 1849, it appears that the wheat crop of that year was injured by an unusual absence of rain,

* See analyses of marls, and the remarks following the analyses.

Digitized by Google

and the ravages of the wheat fly, reducing the average yield to 16 bushels per acre; the harvests of 1850, however, covered the fields with a rich and heavy crop, and happily without any serious damage from that insect.

The varieties of wheat cultivated, are the Hutchinson, Soules, Mediterranean, White flint, and recently the Ohio garden wheat: each variety has strong advocates, but as yet, no positive data exist for a preference beyond the predilections of the farmer. The county society has adopted means for testing the qualities of several varieties of wheat, and until such tests, examinations and comparisons have been accomplished, all present preferences should be considered as unsettled opinions.

The wheat of this county weighs from sixty to sixty-two pounds per bushel.

The cultivation of Indian corn has occupied much attention during the last five years; though it was supposed that the tenacious clays of the county must forbid a profitable return from this crop.

A few of the sandy or light soils of the northern towns had at an early period produced good crops; yet the whole produce of this grain in the county in the year 1840, barely exceeded 175,000 bush.; in 1846, about 7,500 acres were planted with corn and yielded 204,000 bushels or 27 bushels per acre.

The foreign demand for Indian corn in 1847, stimulated producers to plant during the next season about 12,700 acres, from which they obtained a yield of 409,480 bushels, or an average of thirty-two bushels per acre.

The many excellent properties of Indian corn, as a wholesome nutritious food, the rich fodder obtained from the stalk and leaf, for the nourishment of cattle, invite more earnest attention from every farmer to its better and more extensive cultivation.

Though the average quantity of grain from each acre has been thirty-two bushels, yet it is well known that with due care and labor, *sixty* to *eighty* bushels may be obtained. True, this crop requires more labor than most other grains, and a mistaken economy deters many from planting more than is needful for their domestic consumption. Hence the reason that this county has not yet raised a crop much beyond the quantity needed for home consumption, for if fifteen bushels is allowed for each family, and four bushels for horses and cattle per head, five bushels per head for swine, it will require 250,000 bushels for the use of the county; whereas the largest quantity yet produced is about 400,000 bushels, while the average product for the five last years does not exceed 300,000 bushels. The crop for 1850 is estimated in the census at 277,000 bushels.

The varieties of corn generally planted are the eight-rowed and twelve-rowed yellow corn, the grain of which weighs sixty pounds per bushel.

Digitized by Google

The oat plant is a native of a cold climate, and was early introduced and naturalized in the United States. The high summer temperature of the American climate may account for the frequent and general deterioration of imported oat seed.

Soil, climate, and cultivation have in various places, so far changed the character of this plant as to produce varieties, or classes, but all owe their existence to one common origin. The advance in the cultivation of the oat crop in this county is shown by the comparative crops, thus:

In 1840	the whole crop was	 213,826	bushels.
In 1845	do	 292,397	do
In 1848	do	 411,650	do
In 1849	do	 320,000	do

the latter being an average of over 39 bushels per acre. The usual variety is the black oat, weighing thirty-two pounds per bushel. Other varieties have been introduced from time to time, but in a few years they lose the characteristics of their native soil, and may not be considered a remunerating crop.

Barley is not extensively cultivated, nor is it esteemed a profitable crop. It is cultivated or brought into use as beneficial in a system of rotation, and about five thousand acres are devoted annually to its culture. The crop rarely exceeds twenty bushels per acre, heading out upon a straw often too short to admit of binding when cut.

It is probable, however, that sufficient attention has not been bestowed on the cultivation of this grain, for extensive tracts of soil exist in the county well adapted to its full development. The crop of 1848 did not exceed 124,000 bushels of the six-rowed variety, which generally weighs forty-seven to forty-eight pounds per bushel. In 1849 the entire crop was only 85,000 bushels. The two-rowed or chevalier barley was introduced by seed imported from England in 1848–49, but has not been attended with the expected success.

Rye is raised on the light soils of the northern towns. This plant is hardy; it bears the winter without damage, and will mature on any soil. In 1840 the crop amounted to 4,000 bushels yielding an average of only seven bushels to the acre. In 1848 the whole crop produced 28,000 bushels, showing that more careful attention had been bestowed on its culture, for the average yield was raised to thirteen bushels from each acre. It is evident from these facts that rye is an unprofitable crop in the county of Seneca. It requires a better preparation of the soil, or more attention to its proper cultivation. This grain should be sown late in August or early in September, and is on this account peculiarly favorable to the propagation

Digitized by Google

of timothy grass, probably from the fact that this period is more in accordance with the laws of nature, as it is the natural season for committing to the earth the seed of this indigenous grass. This reason is strengthened by the failures of many farmers who attempt to lay their fields with timothy in the spring, or in the autumn. The seed perishes in the waters of spring, and is destroyed by the frosts of autumn.

When rye is well cultivated it will produce twenty-five bushels of grain, and three thousand pounds of straw to the acre. The grain contains ninety per cent of nutritive matter. One bushel of rye weighing fifty-four pounds, will yield forty-two pounds of flour, and make fifty-six pounds of bread. The rye plant tillers freely, offering a rich green crop for sheep in autumn, and an early pasture in spring, without injury to the plant or crop. With these advantages it seems desirable that the farmers of Seneca county should permit rye to have more attention and consideration. The cultivation of rye is so far neglected, that the crop of 1849 does not exceed 3,500 bushels.

Buckwheat is a fluctuating crop, varying from fifteen to thirty, or even forty bushels per acre. The crop of 1848 amounted to 75,000 bushels, yielding an average of eighteen bushels per acre. Extensive use is made of this seed to produce a green crop for turning into or under the soil by the plow. This is generally accomplished when the plant is coming into flower, and esteemed but little inferior to red clover as a green manure. The bran or chaff from buckwheat is found to be very nutritious for cattle.

Flax is not now held in esteem. It was raised extensively ten years ago, but its exhausting power has been so severely felt, that no prudent farmer is willing to injure his farm by a crop which will not pay for the large proportion of elements it carries off from the soil. About 6,000 bushels were produced in 1848, and less in subsequent seasons.

The hay crop is a most important object, and in this region it occasionally falls short of a sufficient supply, arising from the greater proportion of acres being devoted to grain crops. The whole number of improved acres is 151,000, of which only 25,000 acres are occupied as grass lands for hay.

In 1840, the crop of hay was estimated at 38,163 tons; in 1848, the estimated crop was 38,800 tons, indicating no material increase of this description of fodder, while official returns prove an increase of cattle, horses, and sheep. Much inconvenience was endured through the last winter, from the want of hay, a want not unfrequently rendered more severe by improvident waste in feeding. These occasional interruptions of the farm economy administer lessons of wholesome severity, and early correct the evil. It is

Digitized by Google

true, the season was alike unpropitious for hay as for grain last year, but the increase of stock, without a corresponding increase of acres devoted to their support, proves the general position.

Potatoes have received but limited attention. The ravages of disease, the absence of any remedy, and the difficulty attending cultivation of root crops in the stiff clays of this county, restrict the production to a quantity barely sufficient for domestic uses. The yield seldom exceeds one hundred bushels per acre, except in the light and gravelly soils of the northern towns. The crop in 1849 did not exceed 80,000 bushels.

The disease which has for several years injured the potato crop in most parts of the country seems enveloped in darkness, as impenetrable as when first it blighted the farmers' hopes. The usefulness and excellence of this root demand continued observation and inquiry as to the nature of the disease, and the errors, if any, in the modes of cultivation.

The fearful results in Ireland, arising from the general destruction of the potato crop in 1847, when famine and disease annihilated many thousands of the people, induced the offer of valuable rewards for the discovery of the cause—industrious talent was taxed to its limit—numbers of reports were presented to the agricultural societies of Ireland, Scotland, and England, all containing valuable observations, many of them conflicting, none of them satisfactory.

It is only about one hundred years since the potato became generally cultivated in Scotland, and then with doubt and hesitation; before the year 1800, however, the potato formed a large portion of the food of the Scotch people, especially in the Highland districts. The proverbial thrift and caution of that people, at once led them to contend with the disease, which, in 1846–7–8, was depriving them of food, and in some places reducing them to a condition of suffering almost as intense as affected Ireland.

It was remembered that in 1806 the white potato and the "leather coat" were the only potatoes then cultivated, though occasionally the large pink eye, or "Virginian" variety, was planted. It was then ascertained that a variety called the Perthshire red yielded *in quantity* nearly double the amount of the whites or the pink eyes, consequently these Perthshire reds supplanted all other varieties; but in time doubts arose as to the amount of *nourishment* in the new variety, when experiments were carefully made which proved that the new variety was less nutritive than the old, in the proportion of five to seven. The Perthshire reds have been continued as a principal plant until a degenerated and enfeebled constitution, or other cause has rendered it liable to disease and destruction, like all other varieties.

The great object of attention since 1846 has been to procure a variety,

Digitized by Google

which could withstand the potato disease, and experiment has introduced numerous varieties; some *with long* and others *with short stems;* one variety with close dense foliage, another with light and thin leaves.

Without any present means of knowing the systems of cultivation there in use, it seems evident from the difference of leaf and of stem, that a different cultivation might be necessary, and this observation is made, purposely to draw more attention to *the variety* of plants used in this country, with their habits both above and under the ground. When Mr. Knight, the well known horticulturist, turned his attention to the potato, he planted whole tubers six inches apart in drills *four* feet asunder on light soil, and obtained five hundred and thirty-nine bushels per acre each bushel weighing eighty-two pounds, the variety planted by Mr. Knight was called "Larkman's potato." March was the time for planting in Scotland, and is now most generally adopted, presenting another feature worthy of attention here, that is earlier planting.

If the potato draws much of its sustenance through its leaves, and as all leaves when shaded become inefficient, it is evidently important to give the potato plant more space than is usually afforded to it; rows four feet asunder are full near.

In 1828, the opinion was entertained that "exhausted varieties were too often cultivated, and that vigorous seedlings would yield the largest return." This view has been entertained in this country, and strongly impressed with this belief, the idea of re-introduction from the native habitat of this esculent, was suggested by General Joseph G. Swift, of Geneva, to the Secretary of the Navy department, and instructions were issued to officers on the coast of Peru, to procure when practicable the potato tuber, from the Gorges of the Andes, and transmit them for cultivation in this country. It will be interesting to watch the progress of their cultivation, and their arrival will be looked for with impatience.

One other consideration in the culture of this plant deserves notice; a healthy plant at or near maturity has about ten sets of main roots, with four to each set. The length of the main fibres is about twelve inches, and a mean length of four inches for every lateral fibre. If these data are correct, it will be readily understood, how extensive are the demands upon the soil for food, and how numerous the mouths to supply one plant, and the inference seems irresistable that more ground is needed by each plant than is usually allowed, and that the operation of hoeing should be effected with more discretion.

The improvement of the soil, with an increased attention to the various crops within a few years, is admitted, and is evident; yet there is a want

Digitized by Google

pervading probably the agricultural community at large, of closer discrimination as to the soils appropriate to particular crops; and there is also a want of more intimate knowledge of the nature of the various soils, and crops cultivated. Every candid man will doubtless admit these truths, and the exertions of the present year will not fail to produce an effective remedy.

The analyses of more than fifty farms spread over each town, are a substantial proof of the above allegation, and of the judicious action of the farmers of Seneca county to apply the most sure and reliable means to understand the nature and best method of managing their soils.

This however cannot be accomplished by any system of *cheap* farming. The soil cannot be brought into condition, nor can it be retained in fertility, without the application of manure, and constant additions of some kind, equivalent to all that is taken away by the crops.

It is a wanton waste of property to pursue, what is usually called *cheap* farming: it is in truth an extravagant and ruinous system.

The word "cheap" in the ears of many has an agreeable sound, having a supposed relationship to prudence and economy, but this is one among several self-deceptions to which the farmer is liable. The word "cheap" in agricultural, as in most other matters means *inferior*. When a cheap article is obtained, the probability is that deception lurks somewhere about it; it is either imperfect in fabric or material, or purchased at less than its bona fide value; in which case, the purchaser is but aiding in the ruin of the seller. The proneness of man to run after cheap articles, or bargains, is a fruitful source of fraud, as it induces the production of commodities fair to the eye, yet valueless for use. The maker or manufacturer is tempted to administer to the cupidity of his fellow men; obtaining a full value and large profit on inferior products, or cheap articles, made expressly to gratify the desire for "bargains," and to do which less labor has been employed, inferior materials used, and the same exterior presented to the eye, as is usual in the perfect article. Thus deterioration is encouraged and the farmer who thus acts, too soon finds himself cheap in the eyes of the world. Though these remarks apply with equal force to all classes of men; the more quiet and somewhat insulated position of the farmer seems to expose him more to the influences of men who would use the specious plea of cheapness.

One other remark upon a practice nearly allied to the foregoing, may not be out of place and that is, using seed grain of inferior quality, forgetful of the sound maxim that "like produces like." Some farmers have sown the refuse grain of their winnowing mills for seed, others the "tailings." The seed did vegetate but it is difficult to believe that any result was had other than short heads of grain, with diminutive seed.

Digitized by Google

Vegetable is like animal life in this respect; the most perfect symmetry and form is generally carried from the parent to the offspring. So likewise full sound healthy seed, will in good soil, insure good sound and abundant crops.

A selection of the finest seed is not alone sufficient for good crops; it must be free from the seeds of weeds, every one of which either thrusts the cultivated plant from its rightful position, or robs it of the food intended for it, in either case diminishing the crop.

Rotation Systems.

Careful observation seems to have satisfied the farmers of this county, that excessive cropping is injurious to their farms, and that a system of rotation of crops must be maintained, whereby manures and fertilizing matters shall be added to the soil in a proportion, equal to, or greater than is annually taken away; and though ever productive, yet shall be preserved free from weeds and noisome plants.

It may not be necessary in this work to explain the necessity for and advantages of well arranged rotations of crops; a reference to the analyses of grain and seeds (see appendix) will afford a useful illustration. Clover fields are uniformly dressed with gypsum, and a luxuriant growth follows the practice: clover is found to contain, when in a healthy condition, about six to nine per cent. of gypsum, unless therefore, the soil contains a portion fully adequate to the supply, or that a sufficient dressing be carefully applied to the growing crop, the plant will not flourish nor yield its perfect seed. Hence it is clear that, a course of rotation, which shall cause gypsum (plaster) to be added to a field, other elements being in due quantities, such soil will yield abundant crops of clover. So likewise with wheat: lime, potash and phosphates are essential constituents of this plant, which are largely carried from the fields by every crop that is harvested; any succeeding crop, therefore, in rotation, which shall by its mode or system of cultivation add these important ingredients, will the sooner prepare the ground for another crop of wheat in rotation; whereas repeated crops of wheat in successive seasons, must inevitably be deteriorated and unprofitable.

Every practical and well informed farmer admits these facts, and assents to the propriety of a judicious system of rotation. He is aware that by this system, his fields never become "tired" of clover or of any other plant; his fields increase in fertility instead of exhibiting signs of exhaustion, and his pastures are rich and lasting.

Another important benefit derived from a system of rotation is the fre-

Digitized by Google

quent destruction of worms, grubs and insects, which have too often devastated the crops, on fields long continued under one unvaried course of culture or use.

Rotation destroys not only the insect, but with it countless numbers of insect eggs, depriving others of their natural food, they forsake the farm where frequent interruptions disturb and destroy them.

In this grain growing region a common rotation has been, wheat and clover; but a better system is corn, well manured, wheat and clover.

It must be admitted, that with the knowledge and facts of this system, broadly presented and successfully accomplished by many excellent farmers, yet there are many farms in the county which give evidence of improvident over cropping. Not only by the product of ill developed grain, but also, by the display of chess and thistles, which rob the grain of a share of potash, lime, and the phosphates, and deprive the owner of many comforts and enjoyments, which a more correct system would have secured for him.

One other benefit of this system should be named because of its economy and profit, i. e. it avoids *the loss* of a year in the cultivation of wheat.

A farm *thoroughly* cultivated with a three or four year rotation, becomes free from weeds; and being well supplied with manures, the old system of naked fallows may be omitted, and every acre devoted to useful and profitable products. This thorough cultivation is adopted by some farmers with signal advantage, but here as in most parts of the State, weeds are too often allowed to hold dominion and mastery over many a farmer, forbidding the use of the thorough system alluded to. The same powerful influence which now compels the farmer to seek for means to re-fertilize his exhausted soil, must ere long induce him to eradicate every useless plant which interferes with the growth of his grains or grasses.

If it were practicable to introduce root culture into this county in a course of rotation, it would tend to deepen the soil, and cause a better preparation for other crops. The climate and soil, seem, however, to forbid the use of roots to any extent, thus depriving the farmer of one means of *deep tillage*. Other and effectual means are in use, such as draining, deep plowing, and sub-soil plowing: these afford all the important advantages of deep tillage. Deep plowing is generally practiced by observing farmers, who run their plows at the depth of eight inches. The average depth of the furrows of the county does not exceed six inches: especially on the stiff clays, as the seasons interfere, and under such circumstances render the tillage imperfect. The difficulty is fast disappearing, for draining and manuring have changed the clays, lessening their tenacity, increasing

Digitized by Google

their temperature, connecting them to richer loams, and enabling them to yield larger crops of grain.

The evidence of every successive year, has clearly manifested the economy and profit of deep tillage; the mechanical operations on the soil, require less force and labor, less seed is necessary, and all manures produce their full effect. Many of the best informed farmers are firm in the opinion, that deep plowing and subsoil plowing, are more effective on wheat soils, when a judicious system of drainage has been adopted; for though deep tillage by the plow, allows the roots of plants to seek their food at a greater depth from the surface, yet they will extend themselves to the cold influences of retained waters, where drains do not exist, and be deprived of that full measure of health and vigor, which the principle of deep tillage is intended to afford.

The practice of a Romulus farmer is here given as being consistent with sound observation and with science. He manured his field with thirty-two loads of manure to each acre, and planted a crop of Indian corn: the next year he planted the field, (five acres) with potatoes, beets and peas; the third year the field was seeded with grass seed on barley. His reasoning was thus, the Indian corn would take away the phosphates applied in manure; but there remained a considerable portion of other substances useful to other crops such as soda and potash, these being essential to potatoes, he obtained a crop equal to his hopes—the beets were good and peas abundant. He concluded that lime enough with other ingredients, yet remained for a heavy crop of hay, and here again he was right in his theory and successful in the crop. After communicating these facts he was gratified and somewhat surprised to learn that he had in truth closely followed the rotation pointed out by Professor Norton in his valuable "Elements of Scientific Agriculture," recently published, and he heartily subscribes to the principle there laid down, that "rotations are necessary and afford the only means as yet discovered, through which the majority of farmers can regularly obtain heavy crops with profit to themselves, and at the same time keep up the value of their land."

Pasture and Hay Grounds.

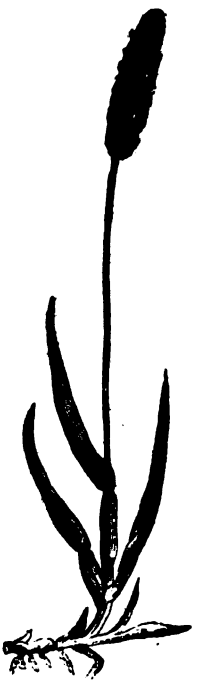
In a county where grain is the chief product, a small portion of the soil is reserved for pasture or hay. Heretofore about one-eighth of the county appears to have been used for these purposes, and produced an average yield of one ton and a half of hay to the acre. At this time about one-third of the arable land is in grass for pasture and hay.

In Great Britain and Ireland the proportion of meadow lands is nearly two-thirds of their whole surface. In Germany, the proportion is said to

Digitized by Google

be one-fourth. In France it is one-seventh, while in Spain, Italy and other nations only one-tenth of the soil is in pasture and meadow.

The practice in this county is similar to the practice of England in the treatment of grass lands, where the improved systems of rotation are maintained. The fields are pastured, then broken up for grain, and in course laid down in grass, which yielding in succession hay, seed and pastures are again carried through the same system of rotation. Grass lands on low margins of the lakes or on moist levels, are retained for a longer period as pasture ground, the proportion is however, limited, as the banks of the lakes rise abruptly from the waters, presenting a soil not well suited to permanent pastures.



Timothy.—(*Phleum pratense.*

Fiorin Grass.—(*Agrostis stolonifera.*)

The cultivated grasses are red clover and timothy; occasionally the red top is mixed with the above, and (though rarely) orchard grass. Red clover is sown in the spring upon the winter wheat at the rate of twelve to fourteen pounds of seed to each acre; as this plant is biennial, enduring for two seasons only, it is customary to sow the seed of timothy grass at the same time with the clover seed, in the proportion of twelve of clover to six

Digitized by Google

pounds of timothy seed. The timothy will then follow the clover, producing the richest and best hay for horses.

In regard to sowing clover seed, many scatter it on the late snows, and others on the frosted ground, believing that it is thus easily admitted into the soil and covered by the heaving and falling of the crust of earth. It may well be doubted whether this system is correct, for it is unnatural, and if the sown seed should vegetate by reason of a few warm days, and then be covered with frost and ice, as is often the case, the young plant must suffer and perish. The application of gypsum or plaster to clover is universal. No prudent farmer omits to dress his clover lots with plaster at the rate of one bushel per acre. This is done at a cost of about twelve cents per acre for plaster, which can be readily had from the quarries at Seneca Falls, or from the plaster beds of Cayuga. The analysis of the ash of the clover plant shows a large amount of lime and sulphuric acid, among its elements, and this explains the very striking benefits derived from plaster or gypsum.* It is probable that clover fields would derive a yet greater advantage if they were *harrowed* before the plaster was applied, and before the clover shoots strongly forth.

Farmers differ in practice as to sowing timothy seed when unmixed with clover. If sown in the spring it is liable to perish during the heat and drought of summer, and if sown in autumn, it will perish with the frosts and snows. The most natural season to deposit this seed with success, is in the month of August, and if then sown with rye both crops generally succeed. When sown in the spring with oats or barley, it *may* succeed, but often fails, and the same results from autumnal sowing. The August sowing is the most successful and best practice. As timothy grass does not produce an aftermath, it is usual to sow with it either red top, or orchard grass, to give a second cutting, or to thicken the bottom for heavier crops of hay, or closer pasture for cattle.

An analysis of the ash of timothy has recently been made,† by which it appears that nearly thirty-one per cent. of the ash is potash; hence it is evident that the use of ashes, leached or unleached, are necessary and important to promote the healthy growth and maturity of timothy, and it cannot be doubted that a judicious annual distribution of lime, plaster, and ashes would increase the hay crops of this county in a large ratio.

The clover plant is here generally ready for the scythe early in July, and a second crop is taken for seed in the autumn. Some, however, feed the second year's early growth of clover from May to the middle of June, and

* Plaster is a combination of lime, sulphuric acid, and water.

† Emmons.

Digitized by Google

then let it run to flower, cutting it in season for seed. In this way much vegetable matter falls from trampled plants, assisting to enrich the soil.

Timothy grass is not generally matured for cutting until the end of July, a period most important to the farmer for securing his grain. Consequently this grass is from necessity allowed to stand on the field until the seed is perfected and ripe, having taken from the stem and leaf those properties most essential for the nourishment of animals. With a view to securing the timothy crop in its best condition, it needs to be cut and cured ten days or more *before the ripening of the seed.*

Red top or Herds grass, or Common Bents. (*Agrostis vulgaris.*)

Orchard Grass. In England called cocksfoot. (*Dactylis glomerata.*)

Fertile fescue. (*Festuca pratensis.*)

It would be an improvement to the hay and pasture grounds of this county, if red top grass were more generally cultivated. Red top is a valuable and acceptable fodder for cattle, and another important characteristic is, that it is a less exhausting crop than timothy, as it contains only four or five per cent. of potash, while timothy contains over thirty per cent.

It is now evident that an increasing desire to improve the stock of the county of Seneca, will demand more attention to the production of nutritive grasses for pasture and hay. The period has arrived when a characteristic

Digitized by Google

distinction must be made between meadows, or mowing grounds, and pasture land. While grain crops yield a full remunerating profit it will be important to ascertain the relative values of the various grasses, in order that the most productive and nutritive may alone occupy the soil, and thus avoid a diminished appropriation of acres to the growth of grain, yet meeting the increased demand for hay and pasture.

With this intent, meadows or mowing lands should be stocked with timothy,* fescue, meadow foxtail, and meadow grass. The biennial rye-grass will be a valuable addition if introduced into the county. One or two unsuccessful attempts have delayed this object, yet it is very desirable to naturalize this nutritive grass in this region. Successive efforts ought to be encouraged, and there is no good reason to doubt full success. Timothy grass has been already named as cultivated. The fescue grasses† have not received the same attention. This grass is very acceptable and grateful to every kind of stock, and they consume it with a keen relish. Sheep and horses will occasionally show a preference for the meadow foxtail, and for young timothy.

The meadow grasses (or spear grasses) shoot forth early in the spring, offering an agreeable repast to every animal. A field stocked with these grasses exclusively will afford the best and most nutritive hay.

Pasture fields require a different herbage, and should be treated according to the early or late pasturage best adapted to the wants of the proprietor. The following grasses seem to be most appropriate to *early* pasture grounds, viz: foxtail and the vernal grass. The first has been already named as an excellent grass for meadows, and the latter is well known as common in most pastures giving a rich fragrance to meadow hay. This grass is not much relished by stock, yet as an early green food is eaten by them with advantage.

The annual meadow grass is the most common of all grasses. It will be found in fields perpetually flowering, affording a sweet and acceptable herbage for all stock. These grasses when cultivated carefully, yield an early and large amount of pasturage. They ought to be sown in September, and then will not fail to produce good pasturage during the following season. If sown at an earlier date the seed will be liable to perish during the continued hot and usually dry weather at the season of harvest.

* This grass derived its name from Mr. Timothy Hanson, who first cultivated it as a hay grass most successfully in Maryland.

† Drawings of the cultivated grasses are added to this work, and the seed of each variety is deposited in the rooms of the State Agricultural Society, for the examination of all who seek or desire such information.

Digitized by Google

Among the *later* pasture grasses may be named timothy, and fiorin, which is a common grass in England. It does not however, succeed well in dry soils, though on the rich soils of this county it will prove valuable.

Infertile fescue. (*Festuca elatior.*) Slender fescue grass. Rye grass. (*Lolium perenne.*) Meadow fox tail grass (*Alopecurus pratensis.*)

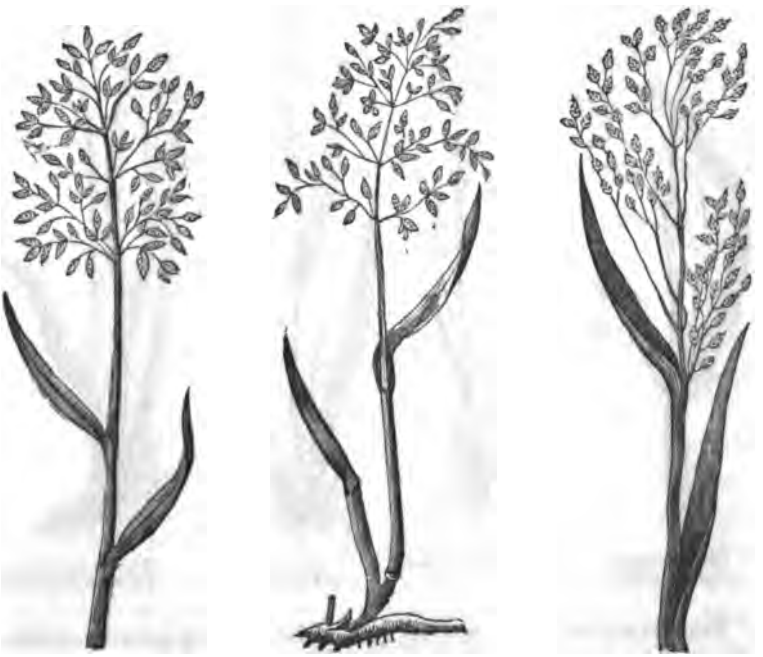
Farmers are aware that in every pasture field there is naturally a mixture of grasses which produce more or less according to the season. Yet a larger yield and better grass may always be produced by cultivating the above named grass seeds in due proportions. A careful attention to meadow and pasture grounds will ever be largely remunerated by the quantity and quality of spring, summer, autumn and winter food for all kinds of stock. This system of cultivating hay and pasture gounds for permanent use has been partially practiced in this county, with results encouraging and claiming greater efforts and continued application.

A difference of opinion prevails among the farmers as to the proper period for applying manures to grass fields. Convenience has induced some to spread their manures immediately after harvest, others in September, and again others in October. The rule should be to avoid the frosts, snow and ice, for an exposure to these influences must carry off much that is valuable

Digitized by Google

by washing over the hardened surface, without penetrating the soil. The most favorable time for distributing manure on grass fields, is when the rains of approaching autumn may wash the fertilizing matters into the soil among the roots of the grass plants, giving them food for a vigorous and early shoot in the spring.

Meadow Grasses.



Spire grass. (*Poa pratensis.*) Rough meadow grass. (*Poa trivialis.*) Tooth-flowered meadow grass.

The absence of care and attention to hay and pasture grounds is observable on too many farms. The proprietors of such farms are probably intent upon the cultivation of grain only, or may not be aware that where stock are fed upon pastures or meadows, a constant and rapid deterioration is in progress. The phosphates are carried off in the bones, and bodies, and milk of the animals, the manure dropped upon the field affording but a very small proportion of the amount of essential ingredients taken away, and the fields soon exhibit an exhausted condition.

This wasteful practice finds no alleviation by feeding the cattle with enriching food on the pasture ground, from other sources than the products of the farm, for all animals are fed in the yard or pens when intended for

Digitized by Google

the shambles. The improving condition of the cattle, the introduction of full blooded Durhams and Devons, will at an early day correct the evils above alluded to.

Sweet scented vernal.
(*Anthoxanthum odoratum.*)

Fine bent grass.
(*Agrostis vulgaris.*)

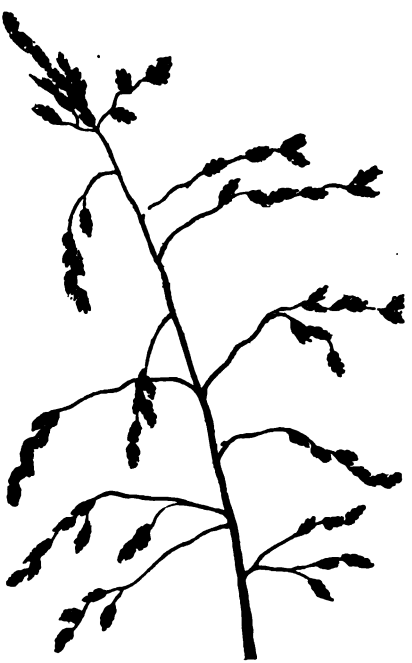
Yellow panic grass.

Digitized by Google

Agrostis-like Panic grass.

Forked awn grass.

Slender crab grass.—(*Eleusine indica.*)



(*Tricuspis sesleriaeoides.*)

Digitized by Google

Weeds.

The high value of labor during the early period of the settlement and occupation of the county of Seneca, and the prevalent error of possessing more acres than could be cultivated by the proprietor, caused a defective preparation of the soil for cultivated crops; consequently weeds and grasses, useless as food for man, abounded in the growing grain, were gathered with the harvest, and formed a mischievous proportion of the seed reserved for future use.

These weeds and grasses abstracted from the soil, a portion of the nourishment due to the growing grain for its full development, thereby reducing the quantity of the crop, in proportion to the loss of nutriment, occasioned by the neglect of the farmer to clean his seed, or to eradicate the weeds after they had vegetated.

The grass crops were as injuriously affected by weeds as were the grain fields; yielding a hay devoid of nourishment for cattle; the more tender and useful grasses, were outstripped and overcome by their rougher and coarser rivals.

A cause for such neglect prior to the year 1820, was, the abundant product of the soil yielded to the moderate labor and imperfect farming of the majority of the settlers: but since the year above named, improvident exhaustion of the soil, diminished crops, and an increase of labor with anxiety, have claimed and secured the attention of Seneca county farmers to a more perfect eradication of weeds and prevention of their growth. The change from indifferent cultivation to a better system has especially marked the period since the year 1840, bringing with it an increase in the average products of the principal crops, and raising the county to the foremost rank of the productive soils of the State.

The weeds which at this time need the most attention, are the pigeon weed, Canadian thistle, cockle, chess, and wild mustard or charlock, daisy, mayweed, dock, and bindweed. A class of low weeds less troublesome, yet injurious, are groundsell, chickweed, shepherd's purse, St. John's wort; and in pastures may too often be found mullein, burdock hog-weed and sorrel. These weeds are classed according to the proportion of mischief or loss, which they impose upon an improvident farmer.

At the head of this list of foes may be ranked the pigeon weed, known also by the names of redroot, and stone weed. This plant has been spread extensively over the middle counties of the State. Its appearance and rapid increase on fields where it did not exist before, in the remembrance of long resident inhabitants, has given rise to the idea, that migrating pigeons

Digitized by Google

dropped the seed of this plant in their flight across the State ;* it is sufficient here to know that this formidable enemy increases more than two hundred fold annually. The plant is covered with short hairs, the stem rises ten to fourteen inches, with four or five branches springing from near the root, and often branched near the top ; the leaves are narrow, being from one to two inches long. At the root or base of each leaf two seeds are found, oval in shape with tapering points, rough, wrinkled, and when mature they are dark brown. The seed is oleaginous, affording two or three quarts of oil from one bushel of seed. Its oily character secures for the seed a vitality for many years if covered in the earth, rendering it difficult to extirpate, when it has once got possession of the soil. Like wheat it vegetates in the autumn, throwing off vigorous plants before the winter frosts harden the earth, it is wise therefore to induce the seed to germinate as soon as practicable when fallen from the recent plants, then to plow and bury them ; if any plants† again appear, the preparation for a spring crop will destroy them. This process of autumnal and spring plowing, is the only reliable remedy for the destruction of this weed.

The Canadian thistle may be ranked second to the redroot, in its evil influences ; great as the mischief is, this pest is more readily conquered, but vain is all labor, and hopeless the task of extinction, so long as a careless or reckless farmer occupies the adjoining fields ; for though labor and care will destroy the root, yet the downy winged seed from a neighbor soon spreads and multiplies the evil.

This weed, as its name imports, is said to have been introduced from Canada ; it is, however, of European origin and not indigenous here, unfortunately it is now naturalized, and is making rapid advances toward the southern States, having passed the bounds of New-York and Pennsylvania.

The roots and seeds of the Canadian thistle, are employed in production and propagation, the root possesses great tenacity of life, sending up new plants from every eye or knotted division ; unless, therefore, these roots are separated below the influence of the atmosphere, and so exposed as to dry and wither, they will continue to send up new shoots or plants.

Frequent cutting of the thistle at the surface of the earth has been found to destroy them ; but no remedy has been found more effective than a summer fallow with frequent plowing.‡

Another foreign enemy to the farmer is cockle, or rose campion, introduced from Europe ; this weed rises to the height of two feet or more; bear-

* This plant is indigenous to England and Ireland.

† See article on pigeon weed in the Transactions for 1846, by Stark.

‡ See an interesting article on the Canadian thistle in the Transactions of the State Agricultural Society, 1846, by A. Stevens, Esq.

Digitized by Google

Lithospermum arvense. Linn.
Corn Gromwell; Steen Grout; Stone Seed; Pigeon Herd
Gallice_Greinil des Champs.
Germanice_Der Steinsamen

Digitized by Google

Digitized by Google

ing a handsome purple flower, the seed vessel contains many black, strong seeds, which contain a fine white flour.

Corn Cockle or Corn Campion.

Chess or Darnel, The Tare of Canaan.

Wild Mustard or Charlock.

These seeds injure the wheat for milling purposes, for if ground with wheat, the black husk breaks into particles so fine as to pass through the bolting cloths, discoloring the flour by its black specks. The cockle plant is so large as to be readily removed from the fields by hand weeding, and none but careless men, will allow it to interfere with the products of their fields, or their reputation as farmers.

Chess is a pernicious weed, known also by the name of darnel. In Scotland it is called sleepies, from the narcotic effects of its seed. In this country it is known generally by the name of chess. It is a hardy weed, resisting the effects of frost more pefectly than wheat; which hardy property may have given rise to a notion inconsistent with nature's laws, that wheat in its progress of germination may be converted into chess. Fields have been sown with wheat, where ice and water have rested on the surface or saturated the soil, the wheat was frozen out and destroyed, but the hardy chess remained in full possession of the field: other circumstances may have led to the like unfounded inferences, which might probably have been dissipated if the

Digitized by Google

parable of the tares, (Matt. 13, 25,) had been understood by the theorists of transmutation. Upon this subject it may be interesting to state that the tares spoken of in the parable were weeds, "in appearance not unlike wheat, having *at first* the same kind of stalk and the same viridity." This weed was abundant in Canaan, and is so in Syria to this day, the reapers do not separate this weed from the wheat until harvest, after threshing they are separated by hand and gathered into bundles, and any remaining seeds are finally separated by winnowing; the grain of wheat is then gathered into the garner, and the chess or tares are consumed by fire. It can hardly be necessary to add that no instance of the supposed change has ever been presented in a fair unequivocal manner; nor can the idea be admitted by any one acquainted with the laws of organic existence. The seed of this plant is noxious to animals if eaten, it is poisonous and should be carefully eradicated, which can be readily accomplished as the plant is an annual. There is another grass somewhat like chess, cultivated on the light soils of England, and known as rye grass, where it is said to afford good crops of hay. It has not been cultivated in this county, and is mentioned here as worthy of inquiry, and having in view prospective improvement.

Charlock, or wild mustard is another troublesome weed, having oil producing seed;* it is difficult, therefore, to dislodge it from the soil, it once encumbers. All the wheat soils are favorable to its growth, and should be guarded against its introduction. If wild mustard seed is buried by the plow, beyond the influence of the atmosphere, it will remain for ages unimpaired, until at length when brought to the surface, it will start into life, and furnish abundant seed to perpetuate a grievous injury to the farmer. There is not probably any better plan for its extermination than to encourage every seed to germinate and then to cut down the plant, as it is an annual, its reproduction is readily arrested: if, however, the plant has been suffered to bloom and seed for several successive years, the great quantity of seed self-sown, will need a long and careful attention for their extirpation. Another remedy is, to plow the plant into the soil when in bloom; or allow sheep and cattle to consume the young and tender plants.

There are several varieties of daisy injurious to farm crops: one species is common in clover fields, and sometimes called horse weed or butter weed. The root is annual, throwing up a stem to a height of three feet or more, branched at the top with the white flowers which expand from July to September, these are readily destroyed by early mowing, or before the seed vessels are fully formed.

The ox-eye daisy is a more troublesome perennial weed; it was brought

* Thirty pounds of oil may be expressed from one bushel of seed.

Digitized by Google

from Europe and has spread rapidly and widely over the State, it is a pestilent weed, needing the plow again and again to exterminate it, where it has taken possession of the ground.

Ox-eye Daisy.

Mayweed.

St. John's Wort.

Mayweed or stinking chamomile, and another of the same species known as feverfew, are common in barn yards and road sides; feverfew occasionally infests the fields; both should be carefully destroyed, and not allowed to disfigure a farm.

Dock is sometimes seen on farms carelessly tilled. Mowing will not destroy this weed, its long taper root passing deep into the earth should be grubbed up, or by a proper instrument cut asunder, several inches below the surface of the field.

Burdock is a biennial plant of rank growth, the burs or florets of which are injurious to the fleeces of sheep, reducing their value. This weed, like dock cannot be destroyed by cutting down: the long, tough root, must be grubbed up, and not a plant of it should be seen on a well cultivated farm.

Bindweed is a troublesome trailing weed, occasionally met with in this county. There are several species, the most common being the trailing buckwheat and the black bindweed. Other smaller weeds, such as St.

Digitized by Google

John's wort, groundsell, chickweed, shepherd's purse, hogweed, and sorrel, are met with; all of which are readily destroyed by good tillage of the soil. Sorrel occasionally overruns a neglected pasture, and may be removed by a dressing of lime.

Chickweed.

Shepherd's Purse

Farm Buildings.

Agricultural edifices for protecting and preserving the products of the soil, for the comfort of cattle and other stock, are generally good in this county. It has been remarked by observing men, that in the counties where a Dutch or German population has spread over the lands, the barns and sheds take precedence in size and importance, the dwelling house and domestic arrangements being secondary in their estimation, though in fact the social comforts are liberally supplied and maintained, supporting the character of bountiful hospitality.

The many Dutch and German settlers in the county of Seneca, have stamped this feature of good barns and sheds upon its surface, and it may be said at this time to characterize the farmer, whether Dutch, German, or British, the eastern man, or the native born.

Barns and sheds are mostly constructed of wood. In many instances the

Digitized by Google

barn is erected on a side hill, allowing the main entrance to be approached on a level with a floor about ten feet above the foundation and lower floor. By this arrangement much labor is saved, by pitching all grains in the sheaf, or hay, downward instead of upward. The basement story is, in a few instances, used for storing grain; the sides and floors being double planked and "filled in" with tan bark. This arrangement secures a medium temperature, and is believed to be a protection from insects and vermin. The main barn ought to be so placed, as to procure an *eastern* aspect for the barn-yard, the sheds and other buildings forming wings protecting the stock from the westerly, northerly, and southerly winds, which at different seasons prevail and entail suffering on unprotected cattle.

Among the many well arranged yards and covered stalls for the care of stock, those erected by John Johnston, of Fayette; Isaac Covert, of Ovid; Jo. Wyckoff, of Varick, are deserving of notice. The barns and buildings of Mr. H. T. E. Foster, of Lakelands, are convenient and well arranged. Judge Sackett, of Seneca Falls, has erected a barn of large dimensions, and well arranged to save labor. An improvement may be suggested however, to most of the farmers of this county. The climate does not permit the exposure of grain in stacks, neither does the additional labor of stacking and removal for threshing, commend itself to the economical farmer. Additional convenient buildings for unthreshed grain, would prove asource of profit on most farms. The want of barns for grain has introduced the wasteful system of threshing grain on the field, using portable machines for threshing and cleaning the wheat or barley and oats, in an imperfect manner, and in too many instances causing a waste of the straw which may be seen in heaps, from year to year, on the farm of an improvident farmer. The following estimate may attract attention, and be the means of introducing a more profitable system. The cost of a permanent threshing mill and a power of eight horses, varies from 150 to 200 dollars. In most cases the best made machine of full size, is the most economical. Supposing then that the farmer erects the *best* machine, the

first cost may be estimated at.....	$200 00
Allow for the value of the space occupied permanently and exclusively in the barn,.....	50 00
The amount of capital invested is,.....	$250 00

which, if estimated at ten per cent. per annum, to cover interest, with wear and tear, gives an annual cost to the farmer *of twenty-five dollars.* If the farm gives twenty acres of wheat, ten acres of barley, and ten acres of oats,

Digitized by Google

which is the average yield of the county, the wheat amounts to four hundred bushels, the barley to two hundred bushels, and the oats to three hundred bushels, the whole quantity being nine hundred bushels. The cost of threshing this quantum by the travelling or portable machine is not less than three cents per bushel, and the expense of horses and one or more men, making the cost of threshing not less than four cents per bushel, equal to a whole cost of *thirty-six dollars.** If then to the annual cost of a permanent machine ($25,) is added the value of horse labor, and manual labor necessary to thresh nine hundred bushels of grain, it is found to be thus:

Four horses, at 50 cts., ...	$2 00
Seven men, at 75 "	5 25
Incidental, ...	75
	$8 00

or a cost of $33; being the sum of three dollars per annum in favor of the permanent mill or machine. To this, however, must be added the value of the grain saved, and the value of the straw saved for feeding stock, and for the manure heap. The seed saved is usually two per cent., but supposing it to be no more than one per cent., it gives a saving or profit of about

nine dollars, ...	$9 00
The straw saved for fodder and manure is worth at least fifty cents per ton, and as every acre will give not less than 2,500 pounds of straw, or 50 tons on the crops, the saving or profit is equal to.....	12 50
	$21 50

The saving added to the sum gained on the machinery exhibits an annual saving or profit of twenty-four dollars and fifty cents. Other considerations in favor of additional barns or sheds, and a permanent power and machine, will present themselves to reflecting men, such as the prevention of loss by storms, the inconvenience of subjection to the time and will of the proprietors of portable machines, &c.

Excellent contrivances for feeding and fattening cattle have been alluded to, yet there is an absence of proper protection for sheep, which seems to require more attention.

The care and protection of swine is too generally neglected, so far as shelter and cleanliness are required. The negligent habits of man are visited without measure upon swine, and their natural instinct for clean dwelling

* The cost often exceeds this estimate.

Digitized by Google

places and dry yards, is obliterated by an education at variance with their natural habits. Swine are endowed with organs of digestion so powerful as to derive sustenance from a greater variety of substances than most other animals, and the appetite is in proportion to the perfection of these organs. It is the want of attention to *regular* feeding, and the absence of cleanliness, which causes swine to suffer from indigestion and disease. Clean pens, with clean straw, are essential for their rest. Sufficient yard room for air and exercise is indispensable, and when the yard is littered with clean straw, the occupant will never defile the sleeping apartment. These necessary comforts and requisites to produce good wholesome pork, are unheeded, to the detriment of the county.

Every farm is fenced with rails, laid with the ends resting on each other, the "worm," or width of ground occupied being four feet. Each pannel is eight rails in height. At each corner two stakes are set, the foot thrust into the ground, two feet from the fence, the head resting against and rising several feet above the rails, and crossing each other from opposite sides, forms a seat or crotch in which is laid a heavy rail or rider, binding the fence together. A fence thus laid occupies a strip of land equal to ten feet wide, which takes from every one hundred acres an area of five acres. This wasteful and unprofitable occupation of the soil has induced several farmers to reduce the width of the fence to two feet, with upright stakes driven about fourteen inches into the earth, and drawn firmly together by a wire band. A firm good fence is thus made, far more agreeable to the eye, when the tops of the stakes are cut to a uniform height. A fence constructed with boards nailed and battoned to sawed posts, is much used; it is neat, strong and sufficient: it will not, however, endure longer than eight or ten years. Wire fences have been introduced but recently, not long enough to warrant any decision as to the advantages they may possess.

Gates have generally superceded the cumbrous bars, adding much to the neat appearance of the farms, but more to the easy ingress and egress to and from the fields and yards.

Drainage.

Few seeds will vegetate when the mean temperature of the atmosphere is below 45° of Fahrenheit's thermometer. Indian corn will not vegetate in a temperature below the mean of 55°: with this fact before him, the farmer may well turn his attention and inquiries to the examination of his soils in the spring, their condition and temperature.

It is well established that the mean temperature of the atmosphere of this county during the month of March, varies from 35° to 37°, and in

Digitized by Google

April from 41° to 44°. The rains of autumn, the snows of winter, the gradual thaw of ice, saturate the earth with water; this water lowers the temperature of the earth. The sun's rays falling on its surface, are consumed by evaporation, they do not penetrate the soil, and when winter lingers but a few weeks beyond its usual time for departure, the wet clays of the wheat growing region are slow to give off their moisture. Under such circumstances the farmer suffers seriously, and seeks with anxiety for the means to dissipate the surplus moisture, to court the genial warmth of the April sun, and thus to raise the temperature of his soil.

Drainage, thorough and judicious, has presented the remedy and means to the Seneca county farmer. The benefits of drainage have been extensively obtained by several enterprising men; oozing acres have become rich warm moulds, sour grasses have given place to crops of rich remunerating grain.

Open ditches, and stone drains had long been used with doubtful success, they were opened or prepared imperfectly; seldom of sufficient depth, and generally requiring attention to keep their action free. Every successive season of spring exhibited the naked soil, where the wheat had vegetated in the autumn months; the plant lying prostrate, held perhaps by a fibrous root, perished in the too moist soil: the crust, raised by the frosts, and depressed in the rays of a mid day sun, had broken the roots and exposed the plant to destruction. The grasses suffered in like manner, and too often the spring crops were retarded by the difficulty of tilling a saturated soil.

These impediments to profitable cultivation claimed the observation of thinking farmers; and in 1835, Mr. John Johnston, of Fayette, imported from Scotland, patterns of drain tiles which had been represented, as forming a durable and sufficient drain; these tiles had been used for draining the wet lands of Scotland, with entire success, and the test of time had fully proved their value. Under the guidance of Mr. Johnston, tiles were made and used in the county of Seneca as early as 1839–40, the cost was then twenty-eight cents per rod; a price too high to admit their general adoption or use.

In 1848, the advantages of well made drains, became manifest on the farm of Mr. Johnston; his crops were increased in quantity, and their luxuriant growth could not fail to attract notice. A near neighbor to Mr. Johnston, had carefully observed the important changes produced on the drained fields, and stimulated by the evident success derived by tile draining, undertook the introduction of the system through the county by an economical production of drain tiles. For this object, a machine was imported from England, by which every known variety of drain tiles and pipes are rapidly made. This machine was placed with Mr. B. F. Whartenby, at

Digitized by Google

Waterloo, near the canal and railroad. Mr. Wharteuby being an experienced potter, has the means for manufacturing and distributing four hundred thousand tiles per annum.

The introduction of this machine in 1848–49, has produced the intended effect; the prices of tiles have been much reduced, being now sold at the following rates, viz:

Drain tiles 4 inches high, by 15 inches long, at $15 per 1000 tiles.

3	"	"	15	"	"	$12\frac{50}{100}$	"
2	"	"	15	"	"	10	"

Flat soles for the above if required, are furnished, largest size at $\$6\frac{25}{100}$ per 1000; smallest size at $5 per 1000.

Drain pipes 4 inches diameter, 15 inches long, at $16 per 1000 pipes.

3	"	"	15	"	"	14	"	"
2	"	"	15	"	"	10	"	"
1½	"	"	15	"	"	9	"	"
1	"	"	15	"	"	8	"	"

As trenches or ditches may be dug at the rate of twelve cents per rod, a drain laid with two inch tiles, will cost about thirty-five or thirty-seven cents per rod. This economical system of drainage has induced many farmers in every part of the county to drain portions of their farms. Mr. John Johnston has laid drains on his farm equal in distance to nine miles, and requiring forty-five thousand tile. The farmer who imported the machine for making tiles, laid about ten thousand of the horse shoe pattern, the first year. The result of the experiment is a conviction, that the increased produce of the soil affords a full and adequate remuneration for the cost.

Errors in the construction of drains have occurred, and unnecessary expense been submitted to, by imitating too closely the systems practiced in Great Britain. The difference of climate, indicates a different application of drains, though the object is the same in any locality: the amount of moisture which falls on the soil of this county may not need as many parallel lines of drains, as are usually laid on fields in England or Scotland; the American farmer needs, therefore, to avoid imitation, to use discretion and adopt the system, so far only, as will carry off all stagnant and surplus moisture; remembering that while his wheat plant is injured by water, his meadows and permanent pastures require a larger share. Until a longer experience and better knowledge of the effects of drainage shall be possessed; the sure and safest rule may be, to drain the fields of all moisture, so far only, as to prevent entirely the growth of all aquatic plants or grasses.

One error in the construction of drains seems to prevail in this county, which should be early corrected. The depth of the trench or ditch, is sel-

Digitized by Google

dom dug beyond twenty-four to thirty inches: it should be remembered that deep tillage is essential to good farming, that the roots of plants often penetrate the soil as far as two or more feet; as a general rule, no drain therefore ought to be nearer the surface than thirty-six inches.

The principles on which the system of drainage is constructed, have been explained so fully in the Transactions of the State Agricultural Society for the year 1849, that it is not deemed necessary to enlarge upon them in this work, but rather to press the whole subject upon the attention and continued study of farmers.*

Insects.

The gradual approach of the wheat fly upon the county of Seneca, and its ravages in the northern towns, attracted attention in 1847. The warning voice of the officers of the County Agricultural Society was raised, and the destructive habits of the wheat fly were explained, at the celebration of the annual fair, held at Seneca Falls in 1848.

In the year 1849, the wheat crops of Junius, Tyre, Waterloo, Seneca Falls and Fayette, exhibited the effect of the wheat fly's presence, they destroyed nearly one-fifth of the crop of these towns. In 1850, the evil was abated and but little loss experienced: this immunity was unexpected, and it is worthy of inquiry by entomologists, how far the climate, season and condition of the crops, may have presented obstacles to the easy deposit of the egg, or what other cause so suddenly and effectually checked the increase of the wheat fly.

When this fly first appeared in this county, it was observed that it deposited the egg, while the chaff or the outer coating of the grain was yet soft and tender, and that when the chaff was tough and impenetrable the fly would seem to seek a place better suited to its purposes of propagation. Reasoning upon these apparent habits of this insect, it was deemed prudent to sow the wheat so early in the season, as to secure a matured glume or chaff to resist the powers of the fly; taking care, however, to avoid too early a period, by which to invite the attack of the Hessian fly. With this view crops were sown from the first week in September to the first week in October, both inclusive.

The unexpected absence of the wheat fly during the harvest of 1850, baffles all experiments for the time, leaving the subject open for repeated experiment, and closer observation.

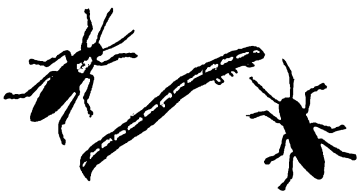
The Hessian fly has ceased to be a formidable enemy, probably for two reasons; first, the period for sowing the seed grain has been retarded until a period too late to offer a nidus to the fly; and second, the soil is better

* See Climate.

Digitized by Google

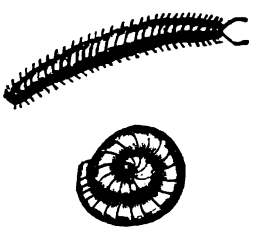
prepared by due fertility to give the plant vigor to resist the influences of the larvæ, if perchance they are lodged on the leaf, or ensconced at its junction with the straw.

Complaints are urged occasionally against the wire worm and cut worm; but careful cultivation, and due attention to a rotation of crops, has diminished this source of loss. In regard to these insects an erroneous impression is prevalent as to their peculiar formation and characteristics; frequently their names are interchanged, and so seldom have they been properly examined that the remedies supposed to be useful for one class, are inefficient for the other.



Wire Worm.

To aid in extending a knowledge of the wire worm, its form is exhibited in the annexed drawing, both of the parent and the worm. The bug parent is familiarly known as the snapping bug, so called from the noise made by throwing itself into the air, when from any cause it is thrown on its back; the action restores the insect to its proper position. The worm is about one inch long, having six feet, it is slender, tough and hard; it is said the worm continues five years before its transmutation to the perfect insect state, during which time it feeds on *the roots* of wheat, barley, oats, corn and grass. Its ravages are sometimes extensive and desolating. The wire worm is found in great numbers, generally on newly cultivated grounds, or meadows, which have been long in repose; they can be conquered, and should not be suffered to revel on the plants of industrious farmers. Exposure to the frosts of winter will destroy them; therefore, autumn plowing is essential; and the course or remedy suggested to destroy the cut worm, is equally effective on the wire worm.



Iules, improperly called Wire Worm.

In various parts of the country the Iules is supposed to be, and often is called the wire worm; but does not belong to that family; a sketch of the Iules is given to correct this erroneous belief. It will be noticed that each segment of the body is furnished with two pairs of legs, whereas the true wire worm has but six. The Iules also, when disturbed or alarmed rolls itself into a coil, which the hardness of the form of the wire worm will not admit of The Iules is perfect in itself, and is oviparous; the wire worm is

Digitized by Google

a larva and cannot produce ova until its transformation to the beetle or perfect state. The Iules consumes vegetable substances in a state of decomposition: the wire worm subsists on living roots in healthful vigor.

Cut Worm.

The appearance of the cut worm is also given in the figure annexed. It will be seen that the insect parent is a moth: there are several species of these moths, and each is destructive in its caterpillar state to all tender plants.

The wings of the moth lay horizontally when closed. They appear in July and August, in numbers sporting in the sunshine, seeking the plowed fields, a garden or the grass fields, there to deposit their eggs; no place seems to offer any peculiar pleasure, for they are found in equal numbers in the fallow, stubble or meadow field. The eggs of this moth are hatched in autumn in temperate climates, and when cold approaches the worm descends into the ground, seeking a comfortable resting place to pass a torpid life, until spring invites them to ascend to the surface, there to feed upon the tender roots of wheat and other pleasant plants. As caterpillars they are glossy, smooth, naked and colored, with dark stripes, and have a black spot on the first ring: they taper at each end and have sixteen legs. Their voracity is so great as to attack with equal zeal buckwheat or cabbage, beans, potato vines and tubers. The parent moth, when pefect, expands its wings full two inches or more. The other and lesser species before named, have the same general form and character. It should be remembered that the cut worm never attacks the planted seed, consequently the use of steeps and poisonous salts are useless as remedies against the cut worm, neither does the Seneca county farmer place any reliance upon unusual applications, he exposes the insect to the frosts of winter, by plowing in the autumn, and stirring the field, if practicable, a second time before the earth is frozen. The friendly birds are enabled by this means to destroy great numbers, and all which are exposed to the rays of the sun, soon wither and die. Salt is generally offensive to all naked worms, and doubtless has an influence to check the cut worm; as a specific remedy, however, no confidence should be placed in it.

The cock chafer or May bug, is the parent of the grub, which is abundant in all pastures or grass fields, especially in soft vegetable soils. The grub is a destructive creature, continuing its devastations for a period of three summers before its transformation, the roots of all grasses and grains are accep-

Digitized by Google

table, but the roots of Indian corn furnish a feast from which they will not turn, until disturbed by the crow, who is too often unfairly abused for mischief unknown to him: doubtless he often disturbs corn grains, around the roots of which the hungry grub is feasting, but the grub is to him far more delicious, far more acceptable to his carnivorous appetite, than the pasty grain of corn. Never will the crow consent to feed on corn until the food appropriate to his natural appetite is exhausted. In early spring these friends of the farmer have been seen industriously seeking the grub in wheat fields, feasting luxuriously, yet declining the spring wheat lying on the fields. Spring plowing and the birds may be considered the effective remedies for grubs.

Cock Chafer and Grub.

Another insect, is mischievous and destructive to well grown and ripening grass plants, it is the aphis or plant louse; its minute character has allowed it to escape the notice of the farmers of the county, until recently, when its ravages on grass fields, reserved for hay, have exhibited their depredations, by brown spots or areas, the herbage having been destroyed by these voracious creatures; these minute insects are countless in number, and need the observance and study of every careful farmer.

The foregoing are the most important among the insects injurious to the crops of the county: their formidable attacks and extended mischief, have in a degree enabled the farmer to examine and understand their characters, habits and antipathies. To this knowledge may be attributed the prevention from loss by the Hessian fly, and there is good reason to believe the same sagacity will find means to avoid the depredations of other insects. There are many farms free from these annoying pests, and this desirable condition has been obtained by ascertaining the periods when the eggs of insects are deposited, and when they assume the character of insects. It is known that the eggs of animalculæ die at the freezing point, and many of them cannot live at the temperature of 20° Fahrenheit. Many *eggs* of insects, retain vitality though exposed to a temperature of 22° below zero; while *insects* themselves will die at from 16° to 14° above the freezing point.

This provision for the preservation of embryo insects leads to the methods best calculated to prevent their increase. It is known also, that eggs of insects, frogs, and lizards, are hatched at a temperature of 45°; and it may well be that others, yet unobserved, are hatched at a lower temperature.

The important fact, however, that cold will destroy the insect, gives to

Digitized by Google

the farmer the clue to the most ready method for extirpating a large portion of the injurious insect race.

Autumnal plowing, and spring plowing should be resorted to, that insects may be turned up from their resting places, exposed to a low temperature, and thus be destroyed.

Like weeds and useless grasses which often usurp the places of better herbage, insects must meet destruction, by a patient, industrious repetition of the remedy suggested.

Implements.

The value of human labor in the United States, consumes so large a portion of its products for remuneration, that no farmer can by any personal exertion, provide a sustenance for himself and his family, without the aid of implements and machinery, whereby he can add to human power and economise time. The necessity for these aids has stimulated American genius powerfully and unceasingly. The results and effects cover every State of the Union, and the inventive faculty of the American citizen is to be found profitably engaged in the useful arts and sciences, in every quarter of the globe.

Water and wind have been long controlled for the use of the farmer, adding to his power by inanimate means. With the increase of knowledge this power gives birth to new contrivances; new tools are prepared, again abridging human labor, and giving increase of power. It is from these sources united that the agriculturists of this State have been enabled to bring rapidly under subjection the pathless forests and uncultivated lands; that they have usefully and profitably consumed materials or converted them into valuable substances otherwise useless and worthless. It is from knowledge thus exerted, that the farmer spreads his action over a broad surface, and to a uniform depth for a longer period. Not only are force and time economised, but materials also. By mechanical contrivances his labor is applied direct, accuracy of work is insured, and similarity of results maintained. In European countries where the laboring population were, from various causes, sunk in dark ignorance, they were alarmed at the introduction of machinery, under the mistaken apprehension that manual labor would be in less demand, and their burdens, already great, would be increased with sharper suffering.

Men of more enlarged views could not suffer under such an error, nor be led into the false conclusions of such unfounded impressions. It was soon discovered that every aid to the farmer, economising his time and his labor, enabled him to apply that portion of labor thus saved, to produce a greater

Digitized by Google

quantity of grain, or other product. And surely, whatever increases, at the same cost, the food and comforts of the people, deserves the approbation and warm encouragement of every philanthropist, and of every sound thinking citizen.

Happily in the United States, the errors above named have never prevailed. Education and the intelligence of the masses are barriers to their promulgation. The plow and the anvil, the hammer and the loom, alike claim and urgently demand the application of science to extend power and diminish human labor, or in other words to allow all that portion of labor and time saved by the use of machinery and implements to be applied to further production.

It does not belong to this work to combat the fanciful notions of political economists, who vividly picture to themselves scenes of distress from over production of the fruits of the earth. Their speculative views may possibly promote some local or special object, but until the human race shall have been concentrated within narrow limits, or climates shall have been changed, no over production can occur in the necessaries of life. No where has an excess of population ever been known to exist,* and the means of subsistence are placed so sparingly within the reach of mankind at large, that it is not easy, in the present position of the nations of the globe, to conceive an over production of the necessaries of life.

The increasing demand for labor-saving machines, the large bounty paid to inventive talent by agriculturists, is a strong corroborative proof of this position, and in no county of the State are these truths better illustrated than in the county of Seneca. A few years only have rolled away since human labor would command a price for its use equal to fifteen or seventeen dollars per month. The high value of such labor necessarily diminished its use. Too large a share of the products of the farm were given to the laborer, and too small a share was left to the farmer for his support. Consequently the *improvement* of the soil was slow, and the products were comparatively small.

Since the introduction of the horse rake, the improved form of plow, the wheat cultivator, threshing machine, and other implements, they have allowed the farmer to increase the quantum of labor on his farm at a less ratio of cost than heretofore, and to produce larger crops from the same

* The condition of Ireland has been presented as adverse to this opinion, but such is not the fact. It appears from official statements made in 1840, that if all the tillable land of Ireland was brought under good cultivation, the island could support a population of more than twenty millions; whereas the population of that country has not exceeded six to seven millions. Other causes than over population must be found to account for the sufferings of that people.

Digitized by Google

number of acres. He is now enabled to supply the consumer at a reduced price, and retain a sufficient remuneration for the use of his own labor, and the capital invested.

Considering the vast importance of mechanical principles to the success of the farmer, it may be cause for surprise that any farm should be destitute of these means of economy. Every year, however, diminishes the number of the improvident, and increases the catalogue of farmers who, with knowledge and enlightened views, seek for and adopt the true, sound principles upon which the practice of their profession can be permanently supported. The plows in general use are the shell wheel plow, made by Mr. Burrall, of Geneva, the Delano, Eagle, Amsterdam, the Iron Beam plow, and Springport. Within the last year, the Seneca County plow has been introduced by Newcomb and Richardson, of Waterloo, men of enterprise and talent, whose success in this effort to abridge labor by perfect mechanism is acknowledged by a large number of farmers who use the implement. The effort of the Seneca County Agricultural Society made in 1849, to stimulate mechanics to a more decided application of science to the construction of the plow, seems to have produced some effect, and the subsequent more extended action of the State Agricultural Society in the same direction, cannot fail to enlist the best skill and talent in perfecting this most important implement.

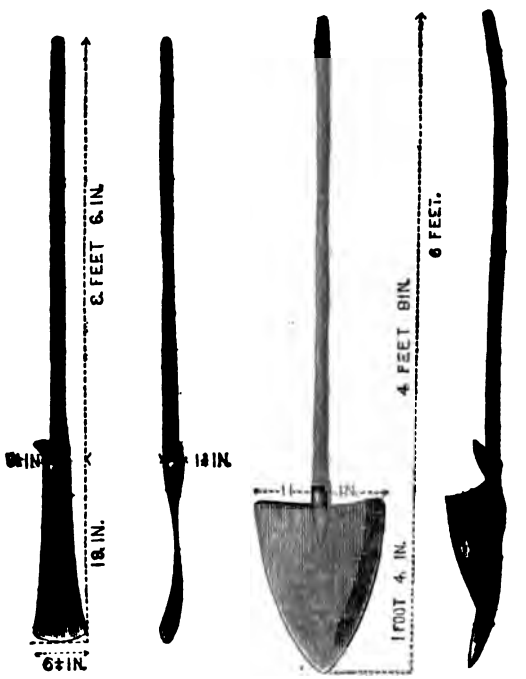
No improvement seems to have been effected in the toothed harrow. The hinged harrow is the instrument in general use, and in most cases are too heavy for covering seed properly. The recent introduction of the wheel cultivator supercedes in some degree the use of the harrow. This cultivator, originally patented by Mr. Ide, is so arranged as to raise or stir the earth from any given depth within six inches, and to pulverize it. It performs this duty well on all fallows and stubble fields, and may be used in preference to the harrow for covering broad cast seed.

In 1843 a machine for reaping grain was brought into the county from Baltimore, Md. It was invented by Mr. Obed Hussey, of that city. This machine proved to be a most able auxiliary, reaping as many acres in one day as can usually be accomplished by seven cradlers, and performing the work in a manner far better and more neatly than can be done with cradles. Since the introduction of this reaper their use has become very general. A brother of Mr. Hussey is resident at Auburn, and makes these reapers. An excellent and improved "reaper" is now made in Geneva by Mr. Burrall, and promises well. Drills for planting wheat and other grain have attracted the attention of many farmers. It places the seed in the earth, and covers it uniformly, thereby saving the expense of harrows for cover-

Digitized by Google

ing. It has been claimed for the drill, that seed drilled into the soil is safe from the effect of frost, and will not "freeze out." This idea is however erroneous, for every wet soil will throw out the wheat whether drilled or broad cast. Drainage is the chief remedy for a "heaving" soil. Seymour's drill has an advantage as it may be used for sowing broad cast, and distributing plaster, lime or ashes. Emery's drill barrow has been successfully used for planting corn. The corn cultivator has been improved by Mr. Burrall, of Geneva, and is found to be effective for the purposes intended.

Irish spades—steel blades. Irish shovels—Hammered blades.



Front view. Side view.

A few Irish spades and shovels have been imported for use in the county. The spades raise the earth from a greater depth than can be done by the common spade of this country, and the arrangement of the handle, which is long, enables the workman to accomplish more work in a given time than is usual in America. In the hands of a Celt this spade seems to serve as plow and harrow. The Irish shovel is a strong tool, but not so convenient for use as the common heart shaped shovel. A great variety of tools for

Digitized by Google

opening trenches for drains have been imported from England by a farmer of Seneca county. The form and use of several of these tools were explained in the Transactions of the State Agricultural Society for 1849, to which reference may be had with advantage. Excellent draining tools are made by Mr. J. H. King, of Romulus.

Threshing machines, both stationary and portable, clover mills, fanning mills, saw mills, corn and cob crushers, and many other labor saving machines are used, but seem not to need more particular notice, as they are common to western New-York.

Before closing the remarks which seemed to be appropriate to implements, it may be useful to call the attention of farmers to a more general use of carts, as being effective in farm work, and more economical than wagons. One horse will draw with ease a cart containing twenty-one bushels of grain, or other material. As it tilts on the axis, it is unloaded at once. Wagons are indispensable, yet many and frequent occurrences present where a single horse with a cart will accomplish the object in the same or less time than would be consumed by two horses and a wagon. Carts are used on several farms, and having proved their usefulness and economy, they seem deserving of more attention by farmers generally.

Cattle and other Stock.

A stranger passing through the county of Seneca, would obtain an unfavorable impression of the breed of cattle, and of their condition. The cultivation of grain being the chief occupation of most farmers to which so much attention and incessant labor is due, few can devote sufficient time to careful breeding and feeding. The enterprising men who have turned their attention to cattle and other stock, have been well rewarded for their care, not only by an increase of value to their herds and flocks, but also by extending the number of improved animals through the county. It must be admitted that many animals possessing rare qualities are to be found among the old native stock, yet it is certain that the best and most profitable breeds of cattle have been introduced from England since the year 1750 and chiefly within the last twenty years. The zeal and exertions of the breeders of Great Britain have produced so many varieties by crossing, that great skill and almost daily experience in observing and handling the varieties, can alone secure a reliable judgment as to pure blood, superior points of excellence, and symmetry.

Farmers are divided in opinion as to the relative merits of the short horn (Durham,) and the Devonshire breed of cattle, these two classes being more esteemed in this county than any other. Among the farmers who

Digitized by Google

give a preference to the Devonshire blood are John D. Coe, and Ezra Miller, of Romulus; James Stewart, of Junius, and Isaac Covert, of Ovid. The bull belonging to Judge Coe is direct from the bull Tiverton, imported from South Devonshire, by Mr. Cowlin. He is three years old, and much admired, giving to the herds of the neighborhood a strong character of Devon blood. In Judge Coe's herd this season are eight yearling calves, and eight calves of this season, giving promise of superior Devon cattle. Mr. Miller's bull is a fine animal, three years old, and the bull belonging to Mr. Isaac Covert will improve the cattle of Ovid. The last named bull was procured from John Johnson, of Fayette, whose judgment in regard to cattle stands pre-eminent. As a disposition to increase this breed seems evident, care should be had in selecting bulls of known pedigree, and possessing the following characteristics: He should be of a dark chestnut hue, or varying from a blood red to a bay brown; his horns should be of a yellow, waxy color; the eye clear, bright and prominent, showing much of the white, and it ought to have a circle of variable color around it, usually of a dark orange; the forehead should be flat, indented and small; the latter peculiarity is esteemed a strong proof of purity of blood; the nose should be a clear yellow; a black or mottled muzzle is objectionable to English judges; the nostril should be high and open, the hair curled about the head, and the neck thick and full.

The Devon cow is small in proportion to other cattle, and is particularly distinguished for her full, round, clear eye, the gold colored circle around the eye, and the same color prevailing on the inside skin of the ear, the muzzle orange or yellow, the rest of the face chestnut without any black or white about it. The Devon cow has more of roundness and beauty, and is more free from angles and hard points than other breeds. Such is the description of Devonshire cattle by an English breeder of celebrity and sound judgment, who adds that for the dairy the Devons must be acknowledged to be inferior to several other breeds. The milk however is good; it yields more than an average proportion of cream and butter, but is deficient in quantity. As nurses this breed is deserving of great praise. Their calves thrive well, and as a breed they are economical. Being small they consume but a moderate quantum of food. This breed is more extensively propagated in the adjoining county of Cayuga, where more attention is given to this important branch of farming than in the county of Seneca.

As illustrative of the care and affection bestowed upon this breed of cattle in their native clime, it may be noticed that often when the setting sun throws a quiet charm over every object, and the farm laborers are wending their way homeward from the fields, the ox-team and ponderous

Digitized by Google

cart move leisurely along the hedged road; the shining skins of the cattle throw off the richest hues of chestnut brown; the teamster plodding by their side rests his hand upon the soft shoulder, or gently pets them with kind expressions. A boy always attendant upon the team, sits upon the cart, and with the teamster chaunts to the cattle a well accustomed tune, seeming to convey instruction, for with the modulation the oxen move to the right or left, and ever and anon the older man throws in a note of deep toned bass in perfect unison—the whole producing an effect at a distance not unlike the waves of sound flowing from the choir of a cathedral, when the full service is performed, and falls perchance upon the ear of a person passing the lofty and vaulted portal. This custom in Devonshire of singing to the cattle is supposed to excite the ox to more exertion, and it may readily be conceived that a closer intimacy and stronger affection must exist between the cattle and their attendants by this constant application of pleasant sounds, instead of the barbarous goad, the irritating whip, or the censurable terms of imprecation.

The cattle of Devonshire are considered as an original breed of Great Britain, and there are those who claim antiquity for the breed of SHORT HORNS on the British soil. It is not needful or useful here to inquire into the origin of either further than may point out the source of improvement, and trace in some degree the origin of the best stock in this county. Before the year 1750 the short horned or Durham breed of cattle were described as possessing extraordinary value as milkers, unequalled by any other breed in England. They were of a large size, thin skinned, sleek haired, rather delicate in constitution, and often defective in the substance of girth in the fore quarters. When stalled for fattening they were slow feeders, producing indifferent meat, and of a dark color. Such were the short horns before the year 1750. Soon after that date many English farmers applied themselves with zeal and energy to improve this valuable stock. Mr. Charles Collings and his brother Robert, were eminently successful. The former obtained reputation for his stock produced from a celebrated bull called Hubback, and subsequently from his famed bulls Favorite and Comet. The Messrs. Collings ceased to give attention to cattle about the year 1810 and 1818. Many other persons were engaged simultaneously with the Collings, as active breeders of the Durham stock, and gave a tone and character to this particular breed, which from its established excellence gave an impetus to breeding, and claimed the attention of most observing farmers, producing results of lasting interest and importance to this country.

Mr. Thomas Bates, of Kirk Leavington, having obtained some of the finest animals derived from the Collings herds, entered upon a well arranged sys-

Digitized by Google

tem for propagating the short horn breed. He early secured a high reputation as a judicious breeder, and from his herd has been derived many of the finest animals imported into this country.

Among the farmers of this State, who with commendable zeal imported animals of this valuable class, are E. P. Prentice, now President of the State Agricultural Society, Mr. George Vail, of Troy, Mr. Chas. H. Hall, of Harlem, Mr. Thos. Weddle, of western New-York, and Col. Sherwood, of Auburn, who has, with tact and skill, recently added to the stock of the country some of the finest and best of the short horned breed. It was about the year 1835 that Mr. Weddle, of Rochester, imported a number of selected Durham cattle, and from them raised a stock which is dispersed over this region. Among the well known animals derived from Mr. Weddle's herd are *American Comet*, out of the imported cow Primrose, owned by Mr. Hentig, of Geneva.

Cataract was a fine bull, bred by Mr. John Johnston, of Seneca county. His sire was Royal William, who was from Mr. Weddle's Forager. ALEXANDER was a bull imported by Mr. Weddle. GAZELLE, a beautiful roan cow, became the property of Mr. Dill, of Auburn. Mr. Dill possessed also the white cow *Hebe*, out of Gazelle by American Comet. JUDGE is a fine animal, bred by Judge Sacket, of Seneca Falls. This bull was got by Forager out of Sylvia, by Copson. He is now owned by Dr. J. L. Eastman, of Lodi. BLANCHE, a white cow got by Atlantic out of Pailfull, both imported short horns. This cow has produced some fine stock in the county by Judge. From the period of the introduction of the bull General, by Mr. Joel W. Bacon and others, as hereafter mentioned, in 1834, and of Mr. Weddle's importation, may probably be dated the most efficient measures for the introduction of the *improved* Durham stock into western New-York, and this stock being derived from England since the year 1750, is recognized by the following characteristics: they are red or white in color, or a mixture of both. No other color is ever found among the pure improved breed. They are distinguished for their milking properties. An eminent English breeder states that the short horns give generally more milk than any other cattle, a cow usually yielding twenty-four quarts per day during the grass season. Among the principal and estimable points may be enumerated the fine, thin, clear bones of the legs and head, the mellow touch of the skin, the creamy color of the muzzle, and around the eyes, and the fine tapering light colored horns. These points alike distinguish the bull and the cow.

This breed is also characterised by the quantity of well laid on beef, every part proportionally full, the fat sometimes preponderating over the

Digitized by Google

lean, which displays that rich, marbled, and juicy muscle, so eagerly sought for and enjoyed, not only by social man, but by the grazier, drover and butcher. Such is the short horned breed of cattle now rapidly increasing in numbers in all the States, and more and more in the estimation of the farmers of Seneca county.

Within a year a well bred bull from the stock of Mr. George Vail, of Troy, has been brought into the county by Mr. Lewis Braden, of Junius. He is now nearly three years old, and is called George the First; was got by Young Duke, by Duke of Wellington, (Mr. Vail's premium bull). His dam is Empress II., grand dam Empress by Coriolanus.

The farmers of Junius evince much desire to improve their stock. Their herds show much Durham blood derived from a bull bred by Mr. Bullock, of Bethlehem, near Albany. This bull, "the General," was procured by an association of farmers of Junius, and has stamped their herds with many points of excellence.

This bull was the first Durham blood brought into this county. He was purchased at the State Society's Fair in October, 1834. He was got by Bethlehem, dam by Champion; G. dam by Comet, G. G. dam by Nelson. Bethlehem was by Comet, dam by Nelson; Nelson and Comet were imported by John Winne and Matthew Bullock in the year 1821, as improved short horned breed. Champion was imported by Hon. Stephen Van Rensselaer of Albany.

To the enterprise of Joel W. Bacon and Richard P. Hunt of Waterloo, Israel Liske, Franklin Rogers, O. Southwick, Stephen Shear, and others of Junius, was the county indebted for the earliest introduction of the Durham blood. Their exertion did not end with this effort; the heifer Strawberry, was purchased for the same association in 1834, derived from the imported Durham stock of Mr. J. Brintnell, of Orange county; from this heifer was obtained the bull Waterloo, by Copson, and from this cross a number of cows feed on the pastures of Seneca county, not surpassed for milking qualities.

In 1837, the Hon. G. V. Sackett and Mr. Clark purchased the bull Copson, well known in the breeding annals of animals; and in 1838, Messrs. Bacon, Sackett, and Hunt, purchased and introduced the bull Forager from the stock of Thomas Weddell.

Thus early did a few farmers see the necessity and advantage of improving the breed of cattle by the introduction of the short horns: an advantage now strikingly manifest on the farm of Mr. Joel W. Bacon in Waterloo; whose stock has been continued to this time unmixed, and beautiful in symmetry; the cows yielding large products of milk and butter,

Digitized by Google

the oxen so perfect as to supercede the use of horses for all farm work. A visit to Mr. Bacon's farm explains very readily one of the sources of profitable farming; when he purchased the improved breed, he was naturally led to take especial care of them, his straw stacks and hay stacks were all in requisition, and liberally used; the consequence was an unusual supply of rich manure; the soil partook of the increase, and in return yielded larger crops; and thus from year to year, increase and accumulation have advanced step by step, until abundance has crowned the farmer's labor and sagacity. This example characterises the results which have flowed to other farmers who, adopting the same course, have caused a happy influence to be diffused throughout the county.

The feeding and fattening of cattle or other stock for market, has not been practiced to any great extent; a few careful farmers have recently turned their attention to this valuable branch of farming, and an evident disposition is growing to increase pasturage and diminish tillage.

The ready communication with the city of New-York, by the Erie railroad, and the extensive eastern markets easily approached by the Massachusetts and Connecticut railroads; present inducements to the farmer, to feed his products to various kinds of stock, disposing of them to passing drovers, while he retains the manure, and by this process returns to the land a large amount of fertilizing material: thus he encourages a new and full crop of fodder, again to fatten his animals and maintain an uninterrupted chain of profit, while he returns to the soil a large remuneration for the elements of food abundantly supplied.

The system of feeding practiced by those who fatten cattle is, to give to each animal during the winter, four to six quarts of corn meal per day, or of cob and corn ground to a meal; or of the meal of oil cake. The quantity is governed by the size of the animal, as the large heavy framed creature consumes more than the smaller and more delicate animal.

It seems that little difference is discoverable between the effects of Indian meal and of oil cake meal, the preference rather preponderates in favor of the latter.

Corn cobs ground with the grain have advocates, and the late analysis of the cob, by Mr. Salisbury, proves the existence of a portion of nutritive matter in the cob, nevertheless, until further facts are obtained, and better methods for preparing the cob for assimilation by animals are discovered, much hesitation will be felt by the farmers of Seneca county, to present it as food to cattle intended for the shambles. Many experiments have been tried by boiling or scalding the ground cob; by steaming it with chaff, &c., yet

Digitized by Google

when presented to the cattle it was unpalatable and refused. Swine declined it, thrusting aside the ground cob and selecting every other delicacy which had been mixed with the cob. Meal is fed to the cattle every morning and evening at stated hours; hay is given to them morning, noon and evening; no more is given at either hour, than will be consumed without waste. The hay is given to animals in boxes or racks in the open yard, when the season and weather will permit; all other food is presented to them in their stalls, where proper mangers are fitted to avoid waste. This is done that air and exercise may be had daily, and that opportunities may be had for cleansing and littering the stalls and sheds; rest and quiet are essential aids to the acquisition of fat. Ample sheds and dry stalls are indispensable to protect the animals from cold and stormy weather.

Most cattle are fond of the dried leaves and tassels of the Indian corn plant, which if cut into pieces not larger than one inch, will be relished and mostly consumed. When corn stalks are well cured, they are found to be a good occasional substitute for hay, making a change and variety of food always agreeable. Salt is always useful for cattle and is never omitted by careful feeders.

Since the introduction of Professor Norton's "Elements of Agriculture," into this county, a better and more economical system of feeding, has been adopted by many. It is better understood that the full grown animal requires a food or material which shall make good the natural and daily waste of its body, a waste always accelerated by labor and exertion. The effects of cold and hunger in reducing the flesh and strength, have so often caused pecuniary loss, that better shelter is provided, and food is more methodically and seasonably given. It has been ascertained that the fat so important to stock, is chiefly derived from the oily and fatty substances in their food; hence the now increased demand for oil cake, and hence the value of a fact not sufficiently known, that *oat meal* possesses as many nutritious qualities as the flour from any other grain: the amount of oily or fatty matter in this food is equal to five or six per cent. Oat meal then is a fattening and excellent food.

Indian corn contains about the same proportion of starch as oats; (60 per cent.) but is more fattening as it contains about nine or ten per cent of oily or fatty ingredients. Bran is extensively consumed by stock; and it is better known of late that, in all grain, the chief part of the oil lies near or in the skin or bran, and it is to this fact that bran owes its nutritive and fattening properties. The nitrogenous ingredients are important in the food named, and all who would understand the principles of feeding and fattening, will naturally turn to the work so freely quoted.*

* Norton's Element's of Agriculture.

Digitized by Google

Horses.—It is probable that no useful animal is more affected by climate and food, than the horse. Derived originally from Asia, from the borders of the Syrian deserts, the horse seems to endure naturally a high temperature, possessing a power and vigor in the temperate zone and within the tropics, which is denied to him, when encountering the cold and storms of latitudes above the 45th parallel: beyond this limit he loses his fine form, dwindling to a dwarfish creature. In the colder regions of the 48th parallel he ceases to live, giving place to the rein deer or the dog.

The climate of the county of Seneca seems favorable to the production of the horse; the rich pastures and meadows afford the elements for developing the finest forms and most enduring constitutions.

Aware of these advantages, enterprizing and careful farmers have successfully produced many graceful, fine limbed creatures for the saddle and carriage, and the useful, active, hardy horse for the farm and the road. Among the successful breeders is Mr. John Ingersol, of Lodi, who has given much attention to the production of well bred horses.

Mr. Charles W. Ingersol has deservedly a reputation for skill and discretion in breeding and raising the horse: he is now breeding from the Morgan stock, being the proprietor of the celebrated General Gifford.

This admired horse is described by a committee of the New-York State Agricultural Society as being "in his size, figure, action and color, closely resembling his sire. Both are exceedingly compact horses, deep chested, strong backed, with fore legs set wide apart, and carrying their heads (which are small, with fine well set eyes) high and gracefully, without a bearing rein. This breed is reputed to possess great bottom and hardiness; and every thing about the two presented, goes to prove that their reputation in this particular, is well founded."

The recent death of the old Gifford Morgan, the sire of the General Gifford, renders the possession of the latter and his continuance in this county a matter of moment and much interest, that his blood may be perpetuated through the many excellent breeding mares owned by the farmers.

Many fine horses have been raised in this county from the imported *Alfred*, and several descendents from the well known *Crocker Eclipse*, range the pastures of the southern and middle towns: a fine stud horse of this breed is owned by Mr. Stout of Romulus.

Another horse known as "Texan Jim," has left several fine colts. *Texan Jim* was owned by Mr. N. Wakeman of Covert, who obtained him om S. Bradley of Westport, in 1838, he was then reputed to be eleven years old, making his age at this time about twenty-three years. This stud was remarkable for his graceful and haughty carriage, carrying proudly a

Digitized by Google

mane and tail of unusual size and length. Mr. Lewis Post is fortunate in possessing a colt sired by Texan Jim, giving promise of all the beauties and excellencies of his sire.

SHEEP.—This useful and invaluable animal, though indispensable to ward off both cold and hunger, has for a few years been diminished in number. It is somewhat strange that the region of the parent stock of the sheep is unknown. They are found wild upon the mountains of Turkey, and on the tops of the highest Asiatic mountains. They range over the summits and sides of the Rocky Mountains of the United States. In Egypt, and on the Moorish highlands they feed and roam. Thus distributed in the two hemispheres, it seems beyond the reach of history to declare their earliest habitation. Wherever the sheep is found they are distinguished by a natural instinct which leads them to the highest grounds, plainly indicating their natural adaptedness to a hilly country, and a natural aversion to lowland, plains and prairies. Their fleecy coats rather prove that climates of less than a temperate medium are more congenial to them, and this is further illustrated by the fact, that when they are removed to the warm regions, the fleece loses its woolly texture, partaking somewhat of hair. Every variety of sheep has been introduced into this country from Europe, yet in this climate, and rather level surface, the farmers find a better and more profitable result from breeding the Merino variety, in preference to others.

A few Saxony flocks are fed upon the southern hills, and in the northern towns small flocks of the Bakewell and Cotswold breeds are fed. The Merino fleeces average three and a half pounds in weight, their carcases have been much improved in size by careful breeding, and Merino mutton is now fine grained, juicy, and desirable food. The low value of wool for several years has doubtless been a leading cause for the diminution of the Seneca county flocks. In 1845 they numbered seventy-two thousand; in 1850 the aggregate number is thirty-five thousand.

The system of feeding the flocks can in many instances be improved by more study, care and attention. Want of shelter from the cold winds and storms of winter, irregular hours of feeding, damaged straw, and hay made from over-ripe grass, too often impair the health, and injure the wool of flocks owned by improvident persons. On the other hand well arranged sheep-yards, comfortable sheds, the floors littered with clean straw, well filled feeding racks, with an occasional feed of oil cake meal or grain, secure to the proprietor healthy, thriving flocks, large fleeces, a full increase of strong lambs, with a satisfactory annual profit. The active markets of Geneva and Waterloo offer purchasers for the clip as soon as it is prepared,

Digitized by Google

and the establishment of depots for wool at Kinderhook and Buffalo, conducted upon honorable and just principles, are attracting the farmers, by means of which woolgrowers obtain the full profits from the consumer, instead of dividing them with several middlemen before they reach the manufacturing districts.

The amount of wool produced in 1849 was one hundred and nineteen thousand pounds, for which better prices have been obtained, and a consequent increase of the flocks will follow. No large flocks of sheep are now fed in this county, but few flock-masters own more than three hundred sheep. In the year 1803, Dr. Rose commenced a system of wool-growing with a small flock of South Down sheep. These were introduced by him and established on his large estate in the town of Fayette. In 1813–14, Dr. Rose improved his flocks by a purchase of the Merino breed, and again about the year 1820, he purchased a number of Saxon bucks in Connecticut, at fifty dollars per head. The result was a product of much finer wool, and reduction of the weight per fleece—being reduced from about four to two and a half pounds. Dr. Rose maintained his flock at the average number of one thousand seven hundred and fifty sheep. In 1830 the entire clip for that year was sold to a manufacturer at prices varying from eighty-seven cents to one dollar per pound. A few years afterwards this flock was sold at auction, yielding an average price of five dollars per head.

Swine are not bred beyond the quantity needful for domestic consumption. The breeds are chiefly the common grass hog, which is a large, white, and rather coarse animal. This breed is probably derived from the English Shropshire swine, improved in this county by a cross with the Berkshire. In the year 1834, Mr. Joel W. Bacon, of Waterloo, introduced a full blood Berkshire boar, imported from England, which greatly improved the swine in all the northern towns. About 1841, some full blooded Berkshires were brought into the town of Varick, by Dr. Henry Reeder. The central towns have been much benefited by the liberal spirit and zeal of Doctor Reeder, whose farm is beautifully situated, on the banks of the Seneca lake.

In 1847 a Chinese boar and sow were imported from Canton, and placed on the Oaklands farm. Being crossed with pure Berkshire blood, a race of Tonquins has been produced, possessing many rare and excellent points. In England the belief is strong, that unless the Berkshire is crossed with the Chinese, or other Asiatic blood, once in six or seven years, they will degenerate in shape and quality. If this be true, and the present Chinese breed be maintained in purity in the county, the improved breed will be

Digitized by Google

manifested in a fine grained pork, small bones, round, full hams, prolific breeders and economical feeders. Though swine may not be bred profitably, nor to any extent by the grain growing farmer, yet the animal is an indispensable agent on a farm. His voracious appetite induces him to consume and convert into manure many articles which, but for his agency, would encumber the farm, and disturb the economy of the house.

It is surprising, when the extent and variety of his usefulness is enumerated—his fat is an article in the form of lard, extensively used in cookery, perfumery and medicine; his flesh is prepared for food, either fresh or pickled, or as salted pork; as dried and smoked bacon; as hams and shoulders, usually smoked; the head and collar is made into brawn, other portions are made into head cheese; the intestines are used as coverings for sausages; the skin or hide is the most general cover for saddles, for shoes also and pocket-books; the bladder always finds use for excluding air from bottles, and other jars or vessels; the bristle is extensively used for tooth-brushes, and for brushes of all shapes and for all purposes—in short no part of the hog is useless. The very hoofs make jelly or glue, and when to this is added the fact that his flesh, when fresh, is very digestible and nutritive, it forms a catalogue of useful purposes not due to any other animal. The whole number of swine in 1845 was twenty-two thousand, and now, in 1850, it is eleven thousand five hundred.

Manures, their Management and Use.

Of all the departments of practical agriculture, not one is more important, or less generally understood, by the mass of agriculturists, than manures. Self-love may feel rebuked by this assertion, but every thinking, candid and honest farmer will admit the position as generally correct. The comparative condition of husbandry between the several counties of this State, places the county of Seneca too high in the scale of production to admit of any special demerit among her farmers, and the above strong assertion, proves only that the subject of manures and their changes, the elements which they contain, and their adaptation to different crops, have not received attention to the extent which their value and importance demand. One farmer will pile the decomposing materials of the barn yard with care, while ten other men, his neighbors, will allow the manure of the cattle and refuse straw to accumulate for several years undisturbed; and when at last the heaps are carried out for distribution, they are undecomposed in such portions as were beyond the reach of air or moisture, remaining available only as chaff or sun-dried straw. Another class will milk their cows on the road side, or in the field, in either case loosing the droppings and robbing the

Digitized by Google

farm. Sheep are sometimes foddered at some stack, distant from the barn yard, where no manure is collected or preserved; and the swine are sometimes seen running at large for the greatest portion of the year.

These practices may be witnessed in every State, as in this county, but the same influences which have so loudly called for better cultivation, have also stimulated numbers to inquire into the value of manures, their classes and characters, their appropriate uses, their care and management.

It does not belong to this work to instruct in detail; able resources for such knowledge are within the reach of every farmer who is disposed to attain a better condition than he now occupies The "Cultivator" of Albany, the "Genesee Farmer" and "Rural New Yorker" of Rochester, and the "American Agriculturist" of New-York, all offer to the farmer sufficient facts to guide or instruct him in the knowledge of manures. If to these be added a careful perusal of the Transactions of the State Agricultural Society, and the Elements of Scientific Agriculture, by Prof. Norton, every branch of his profession will be laid open, and no cause or opportunity will be left for regret.

Of all manures beneficial to the farmer, the products of the barn yard are the best, if properly managed. As the yard is under the farmer's control, as well as the vegetable and animal matters of the farm, so the fault is his alone if his fields lose their productiveness from year to year, or become barren. One reason for the neglect of the treasures of the barn yard may be traced to the fact, that to this time the soil of the county of Seneca has been supplied with vegetable matter or manure by deposits from its forests, while the small comparative amount of animal manure mixed with vegetable matters of the barn yard *seemed*, to the unreflecting, as unimportant.

The season for reliance on the early and long stored treasures of the soil has passed away, and the better and surer reliance upon knowledge applied to the proper management of the fertilizing means placed within the reach of every farmer, must be the ground for his action and proceeding hereafter. As a grain-growing county, the elements of animal and vegetable manures are extensive. The cattle, horses, sheep and swine, furnish resources for many of the richest elements of wheat and other grains, and for every cultivated grass; as their excrements contain largely these very elements. All such parts of plants as are not consumed on the farm, may be converted into like rich elements for crops, hence the propriety and necessity for their preservation and combination, that in due time they may be restored to the soil.

It is undeniably true that few farmers, probably not one, produces sufficient manure to restore to his fields, annually, an amount of fertilizing elements equal to the quantity abstracted by his crops. Other sources, there-

Digitized by Google

fore, have been sought, and science has taught the farmer that from the gypsum beds of his own county he can find abundance of sulphuric acid and lime combined to feed his clover and other broad-leaved plants, for whose welfare it is essential. He commands its delivery on his farm ready for use at the unimportant cost of twelve cents per bushel. Lime, also, is the product of the county, and may be obtained in its caustic state at ten to fifteen cents per bushel. When lime is slaked on the field, it becomes first a hydrate and ultimately a carbonate of lime, expanding to nearly twice the bulk of its caustic state, and in this condition only it is beneficial. In most cases five bushels of caustic or ten bushels of slaked lime, gives a sufficient dressing to a field under good cultivation, i. e., this quantity is sufficient to meet the loss of lime which can be carried off from a field by any one or two crops.

In this county, where the soil is aluminous or clay, a larger or more frequent dressing of lime is found to effect a mechanical change in the soil, rendering it more easily manageable. There are few farms, however, where good long continued cultivation has preserved a due proportion of lime in the soil, as will appear upon an examination of the various farm soils, made expressly for this survey.* Most farms, therefore, will be materially benefited by the application of larger dressings of lime for a year or two, or until the proportion of lime shall be equal to *not less* than one per cent. of the soil. Excellent marls present themselves in various parts of the county, offering resources of great value to restore or supply the carbonate of lime. The decomposed shale surrounding the beds of gypsum rock at Seneca falls, is an excellent marl and may be used for the same purpose.

Bone manure has been used on some farms, and without that decided visible advantage expected from it. It is probable the quantity applied and the care necessary to exhibit its advantages, were insufficient. The cost of bone manure is about twenty dollars per ton or one cent per pound, a price so high as to prevent its extensive use on the soils of this region, until the mode of its beneficial action, and the confidence of the farmer in its value shall be fully established. Instead of bone dust, the urine, wash of the cow yards and stables are obtaining attention, and from them there is no doubt but the same benefits can be obtained at present, and more readily and effectually than from bone manure.

A farmer in this county, who had seen the effects of bone manure, determined to save the refuse bones from his kitchen and other sources; in twelve months he collected seven bushels. He then made a basin on the earth, with ashes, in the same manner as masons prepare the margin of sand to

* See Analysis of soils.

Digitized by Google

contain lime for making mortar. In this basin of ashes he placed the bones, first breaking them with a sledge hammer into fragments; upon the bones he poured sulphuric acid mixed with water, in the proportion of two parts of water to one part of acid. The quantity of acid used was about thirty pounds to every one hundred pounds of bones. As soon as the bones became soft, the ashes and bones were thoroughly mixed, forming a mass of loose material to be sowed by hand as a top dressing for wheat or other grains. In this condition they were distributed and proved essentially useful. The seven bushels of refuse bones made twenty bushels of bone manure, and sufficient for six acres of wheat. The economy and excellence of this fertilizing bone manure proved to be so valuable and great that every farmer should save the bones and try the same process. The various methods for preparing this manure are given in a clear and explicit manner in Norton's "Elements," at page 64. Let them be examined and consulted.

For many years large heaps of ashes surrounded the buildings where pot ashes were made. They were unheeded and refused acceptance, when offered as a gift. All have now disappeared, and are distributed over the grain and grass fields of their respective neighborhoods. The lectures and conversations at farmers' clubs, and at the celebration of the county fairs, have spread much information on the subject of manures. The ash-heaps were consequently soon distributed; the barn yards began to swell with rich materials; the mineral manures have been eagerly sought for and judiciously applied, and the farms of this county are raised from the average produce of fourteen bushels of wheat, to the profitable return of twenty bushels per acre.

Dairy.

The products of the dairy are on most farms limited to the supply of domestic wants. The quantity of butter annually made is about 550,000 pounds, and the quantity of cheese, annually, does not exceed 20,000 pounds. The number of inhabitants being 26,000, it will be perceived that the whole product of butter gives only twenty-six pounds to each person; while of cheese the proportion is less than one pound to each. Consequently the supply for the markets is small.

The constant and silent action of demand and supply is working its resistless power on this agricultural department, and has within two years increased the pasture and grass lands of the county. The excellence of the butter which is made, the well known skill and attention of those who manage the dairy, cause an inquiry for this luxury more and more urgent from year to year; causing surprise that so small a share of attention has been given to this branch of business.

Digitized by Google

It is evident that increased attention has been given within a few years to the selection of dairy cows, and though farmers are divided in opinion, as to the relative merits of the Durham or short horn breed, and the Devonshire, yet the careful selection of *either* is sure to improve the herds of the county. The fact of profitable dairy products being obtained in the adjoining and neighboring counties, adds a greater stimulus to improvement, while it affords conclusive evidence of the perfection which can be obtained, where due care is exercised.

The large yield obtained by Mr. Kiers, of East Bloomfield, from a Durham cow, being sixteen pounds of butter per week for three weeks: likewise the product of Mr. Comstock's cow, of Kirkland, Oneida county, which amounted to seventeen pounds five ounces in one week; also, from a cow belonging to Mr. C. W. Taylor, of Truxton, in Cortland county, amounting to fifty-eight pounds six ounces of butter in four weeks: these and many other like instances point to a standard below which, no farmer should be willing to rank.

For many years the annual average product of the State was only ninety pounds of butter and one hundred and ten pounds of cheese from each cow, which shows how much is yet to be done in regard to dairies.

It is not to be expected, however, in the grain region, that the present routine of the farmers' occupation is to be changed, nor perhaps modified in regard to dairies: neither is it necessary at present, to adopt more than one rule of action, which is to dispose of every inferior animal, and replace the number by pure blooded creatures of the Devon or Durham breed, as inclination may dictate. They will thus increase their dairy products in the proportion of one-third to one-half; and as years roll on the animals which must give place to the young stock as it increases and matures, will always command a much higher price than the old native breed which has so long wasted the labor of the dairy maids and the grass of the fields. The following detailed condition of two towns will illustrate the necessity for more attention to this branch of agriculture.

The largest town in the county contains about 28,229 acres, of which 6,300 are in wood or unimproved. The farmers of this town (Fayette) feed one thousand and one milk cows, from which they produced last year 91,729 pounds of butter and 1,058 pounds of cheese, or an average yield of $91\frac{63}{100}$ pounds of butter per cow per year. Reducing the yield to an average per week, it gives only one pound and three-fourths per cow. Again, these one thousand and one dairy cows are owned by two hundred and forty-seven farmers; the average proportion of the whole yield of butter does not exceed therefore, three hundred and seventy-five pounds to

Digitized by Google

each farmer: if every farmer's family consists of six persons, the average quantity allowable to each person is but a trifle more than *sixty-two* pounds per annum, or one pound three ounces per week. The rich town of Lodi affords a like result: the number of improved acres is 16,311, and the unimproved 4,516. Two hundred and one farmers own and feed seven hundred and seventy-five cows, which produce the aggregate quantity of 63,320 pounds of butter, and 1,274 pounds of cheese. This gives an average portion of eighty-one pounds $\frac{70}{100}$ of butter from each cow, or one pound and $\frac{57}{100}$ per week. The average annual portion to each farmer's family is three hundred and fifteen pounds; supposing each family to average six persons, their respective proportions of this product is fifty-two and a half pounds for the year, or about one pound per week. But the population of villages within these towns is to be supplied, and as Lodi contains at this time 2,276 inhabitants: if the whole product of butter is divided among the resident population it will allow to each 27$\frac{80}{100}$ pounds for their year's consumption.

The town of Fayette contains 3,796 inhabitants, including the several villages, the proportion of butter made in the town yearly, is about 91,700 pounds for each individual, thus showing, that dairy products have been neglected. Butter is an article of domestic luxury, though comparatively of modern use: having been used sparingly in the days of the Romans as a medicine only.

The olive groves of the warm regions supercede the use of butter; while in our colder climates butter and animal food are important for the supply of carbon to the system, whereby warmth is created and comfort increased. Luxury, comfort and habits have combined to class butter among the necessaries of life, and as such it is deserving of care and close attention; especially by the farmer, whose income may be improved by this product, at a moderate cost of capital.

From eighty to ninety per cent of cows' milk is water, varying according to the food; from three to five per cent. curd; from three to five of butter or oil; there is also a variable quantity of sugar. When these several elements are separated, a substance is left weighing when reduced to ashes, from a quarter to three-quarters of a pound in every one hundred of milk. This substance is found to consist chiefly of phosphate of lime and magnesia, and of chloride of potash. This latter fact ought to arrest the attention of every farmer, for it seems evident that every cow must annually deprive the pasture grounds of fifty pounds of phosphate of lime, (bone earth). It seems consistent with science and practice, that the quantity of oil or butter may be increased by feeding to each cow any rich, oily material, being ever careful to mix it with other food in moderate portions, to

Digitized by Google

avoid the unpleasant taste which would be communicated to the butter from a full meal of rich, fatty substances.

Poultry.

The new avenue of approach from the city of New-York to this rich county through the southern counties, winding along the banks of the Delaware waters and the upper branches of the Susquehanna, has recently opened a new source of profit. The poultry dealers of New-York made their appearance on the lake shores within a few days after the regular trains were in motion on the Erie road. Poultry and eggs were swept away at an advance of twenty-five to thirty per cent. on their ordinary value. As articles of luxury in crowded cities they usually command high prices, offering inducements for their propagation to all who can make the needed arrangements, and cause a small share of attention to be given to the yards.

To the grain producing farmer it may be doubtful whether the probable profit will compensate him for the annoyance and depredations committed on his seeded fields; yet if happy in an amiable, thrifty housewife, the largest grain farm may derive a large profit from a poultry yard. Barn-yards will always offer a supply of food for poultry for many months of the year, for few farmers thresh the sheaves so thoroughly as not to leave sufficient grain for feeding and fattening fowls and chickens. During the spring and summer months poultry can take good care of themselves if allowed to roam, for insects and worms are to them a necessary and nourishing food. In this respect they are useful aids to the farmer in destroying many of his enemies.

It is the natural propensity for roaming which forms the chief objection to rearing poultry, and this objection is obviated readily by well-arranged yards. The question then arises, will the object pay for the arrangements and labor consumed in attending it? An answer cannot be given promptly from any experience or practice known in this county, for the farmer who sows extensive fields of grain hesitates to make an experiment involving demands upon his granary, and adding cares to his wife and daughters, (whose domestic burthens seldom find relief or know a termination). There are, however, many persons not extensively engaged in cultivating the cereal grains who can give to a poultry-yard all due care and attention, rearing poultry of various kinds, and obtain from the occupation a very large profit. This source of advantage, especially invites attention at this time, when the poultry dealers from the large cities on the coast can and will reach every town in the county in fourteen hours.

Eggs, chickens and feathers are the sources of profit from poultry. In

Digitized by Google

the absence of all reliable statistics in this department of farm economy, an approximation to its value only can be given, derived from the use and consumption of other parts of the world where the subject is deemed important and valuable. Twenty years ago, official returns of the egg trade of France exhibited an export of eggs to foreign ports in one year, of eighty-three millions and a half, and the estimated consumption of the city of Paris was one hundred and thirty-eight eggs per annum for each individual.

In the United States animal food or meat is generally the principal aliment of man. If, then, one-half the number of eggs consumed by a resident of Paris be allowed to a citizen of New-York, it will require sixty-nine eggs for each inhabitant, or more than *thirty-one millions* of eggs annually, to supply the demand for the New-York market. It is probable that the people of Boston, Philadelphia, and other large cities within a day's ride of Seneca county, are consumers of an equal amount of this luxury. If this supposition is correct, sixty-two millions of eggs must be provided annually for these eastern consumers. It is reasonable to estimate that seven hundred and fifty thousand eggs are necessary for reproduction. Leaving out of the calculation the quantity consumed by the inhabitants of the county, it appears that the immense quantity of eggs required for the markets, and reproduction, may be estimated fairly in the aggregate at about sixty-three to sixty-four millions annually.

The average number of eggs from each hen of a well managed poultry-yard is said to be eight. Upon this data it will require more than *seven and a half millions* of productive hens to furnish the needed supply.

Referring to the statistics of the county of Seneca published in 1848, it appears that three hundred and fifty-six thousand eggs only were returned as the product of a year, and as being the produce of forty-four thousand five hundred hens. Hence it appears that the county yields only a one hundred and seventy-seventh part of the annual supply; and as the county contains two thousand three hundred and forty-nine farms, it shows that the average number of hens is only nineteen to each farm.

These calculations are believed to be near the truth, and are sufficient to prove that the power of the county for this department of rural economy is capable of extension far beyond its present limit, and may be exerted to a wide and profitable range, increasing wealth without any appreciable increase of cost.

Expenses and Profits of Farming.

The domestic comforts of the American farmer have always flowed in a stream so abundant and unceasing, that he has not found it necessary in

Digitized by Google

time past to measure the amount of his income or expenditure, feeling assured that his labor would produce more than was needful for the supply of his establishment. It has been of rare occurrence to find a farmer who had any methodical system of accounts, and scarcely any knowledge of debtor and creditor. Very many instances may be found in every county of the State, where the proprietor does not know with precision the number of acres in any of his fields, nor the number of bushels of grain or other products, derived from any acre of his farm, neither does he know the average product of any portion of his estate. He knows full well that the aggregate amount of money received by him for the products carried to the neighboring markets, exceeds the cost of production, and the excess furnishes every want or desire of himself and his family. Without a debt to any man, except of kindness and good will, his happiness is complete, so far as it is connected with, or dependent upon the results of labor.

Notwithstanding the diminished amount of products yielded from the gradually exhausted soil, the majority of farmers seem content and indisposed to enter upon new systems or calculations in their old age. Yet they see and frankly admit the necessity for a different course to be pursued by their sons, and all others who are to succeed the generation now passing away. They clearly see that the soil must be renovated, but they feel that it needs a system, a practice and study, which vigorous manhood needs to grapple with. The farmers of the present day succeeding the generation which had become wealthy from bountiful harvests of former days have seized hold with zeal the new system, giving to it all convenient study, that they may so practice as to renew former fertility, and once more draw from the earth as abundant crops as had blessed their predecessors.

The period has not yet arrived, though it is fast approaching, when most farmers may give exact statements of quantities and averages of every product per acre, and precise statements of his income and expenditure, showing the true condition of his farm, and to advise him unerringly where to increase or to diminish labor with advantage.

In view of the obstacles and dificulties which yet exist, preventing access to reliable information in each town, diligent inquiry has been made, where accounts either full or partial have been recorded. In all such cases the estimates given in this division are deemed accurate and reliable; in other cases where the products were known and the market value ascertained, fair approximations are obtained, as the labor applied and its value, and other expenses can generally be closely estimated.

A favorable opportunity occurred for exact estimates of the expenses and profits of a farm comprising three hundred and fifty acres, and where account

Digitized by Google

books are "posted up" once in every week. A time book of simple form is carefully kept by one of the employed men, adjusted every evening and left with the proprietor; the time occupied in registering the work done, and the quantum of labor by each man, does not exceed ten or twelve minutes. At the end of each week the laborers have credit in their respective accounts for the value of their labor, or wages, and each field or special work so done is charged with the cost, thus showing at a glance the cost of any particular field, or work, and the sum due to every man at the close of every week in the year. At the end of each month a statement is given in tabular form, of the average cost per man, for the labor performed, and the average cost of the whole farm, per acre, for the cost of cultivation; thus at the end of the year these averages show precisely the increase or diminution of labor and its cost.

The time book, which had been kept without intermission for six years, afforded much to examine and excite interest. It appeared that during the six years, the maximum rate of wages for any year was forty-three cents per day, and the lowest rate of wages was thirty-nine cents per day. The following figures are taken from the time book to show the result of the years 1848 and 1849:

Dec. 31, 1848.	Total number of days of labor on the farm since 1st Jan.,		1,960		
" 1849.		do	1,775		
" 1848.	Total amount of wages paid for labor since 1st Jan..		.....	$618 39	
" 1849.		do	.....	693 61	
" 1848.	Average cost of each man employed per day,		.....	43	
" 1849.		do	.....	39	
" 1848.	Average cost of the whole farm of 350 acres,		.....	2 34	per acre.
" 1849.		do	.....	1 98	"

It may be well to remark here that the labor permanently employed on this farm, comprises four men at annual wages; all other labor was daily labor through harvesting, or for ditching and other necessary work. In the absence of any other exact account of labor on other farms, it is difficult to say whether the cost of $2.34 per acre or $1.98 per acre is relatively high or low; yet the fact that a farm may be cultivated at about two dollars per acre for all necessary labor, is an important feature in farming accounts. It is the custom in this county to pay laborers a certain rate of money wages, and to furnish them with board and lodging; it is necessary therefore to ascertain the average cost to the farmer incurred for board and lodging. It is believed that twenty cents per day is the fair average, which if added to the money cost of labor as above established, would make the maximum value of per diem wages to be sixty-three cents, and the minimum rate to be fifty-nine cents per day. To avoid doubt or question on this point in the es-

Digitized by Google

timates of cultivation of particular crops, the highest average is adopted, with the addition of two cents, making the highest value of wages, including board and lodging, to be sixty-five cents per day. A man with a team of horses is worth $1.50 per day, or a man and team can be hired to plow the soil at the rate of one dollar per acre; this latter rate is adopted in the following estimates.

It is true that higher rates are paid by persons unmindful of the cost, and there are numbers of prudent, cautious farmers, who do not pay as high as the adopted rates. Upon the above basis the value of farming may be estimated, and as a uniform rate of product is necessary for a standard, the latest established averages of the county are assumed, viz:

Wheat,	20	bushels per acre.
Barley,	21	"
Oats,	38	"
Rye,	12	"
Buckwheat,	17	"
Indian corn,	32	"

It is well understood that the grain crops of the county for the year 1850, will prove a yield of much higher averages, yet to avoid error, it is prudent to base all calculations upon data, which may give equal or better results in years to come.

Wheat.

Cost—Plowing a fallow, first time, per acre,	$1 00
second time,	1 00
for seeding,	1 00
Sowing,	06
Harrowing three times, at 38 cts. each,	1 14
Cradling and binding,	70
Housing,	30
Threshing* 20 bushels, at 8 cts.,	1 60
Conveyance to market,	40
Seed wheat, two bushels,	2 00
Interest on value of land, at $50 per acre,	3 50
	12 70

* The travelling machines charge 3½ cts. per bushel, ... 3½ cts.
Four horses furnished by proprietor, equal to ..... 3 "
Board of men and horses, ... 1½ "
8 " per bush.

The cost of threshing often exceeds this estimate.

Digitized by Google

Product—Twenty bushels of clean grain, at $1,....	$20 00	
Two tons of straw,.....	5 00	
		25 00
Profit per acre,.....		$12 30

Barley.

Cost—Plowing and harrowing, first time,.....		$1 38
second time,*		1 38
Sowing,.....		06
Harrowing in the seed,.....		38
Half cost of 30 loads of manure, 12½ cts. per load,		1 88
Hauling and distributing manure, ...		1 50
Harvesting and housing,.....		1 00
Threshing 21 bushels, at 8 cts.,.....		1 68
Conveyance to market,.....		40
Seed, three bushels, ...		1 50
Interest on value of land,.....		3 50
		14 66
Product—Twenty-one bushels barley, at 50 cts.,....	$10 50	
Two tons of straw,.....	5 00	
		15 50
Profit, per acre, ...		$0 84

Oats.

Cost—Plowing and harrowing, first time,.....	$1 38
second time,.....	1 38
Sowing,.....	06
Harrowing in the seed,.....	38
†Half cost of 30 loads manure, at 12½ cts., per load,	1 88
Hauling and distributing manure, ...	1 50
Harvesting and housing,.....	1 00
Threshing 38 bushels, at 6 cts.,.....	2 28

* It is not always necessary to plow twice for barley; yet in the weedy condition of many farms, it becomes useful and necessary.

† A portion of the manures may be properly charged to the meadow lots; the estimates may be varied as to the crops receiving the application of manures, yet they must not be omitted as a charge upon some division of the rotation practiced.

Digitized by Google

Cost—Seed oats, three bushel, at 28 cts.,			84
Interest on value of lands, at $50,			3 50
			$14 20
Product—Thirty-eight bush. clean oats, at 28 cts.,	$10 64		
Two tons of straw,	5 00		
			15 64
Profit, per acre,			$1 44

Buckwheat.

Cost—Plowing and harrowing twice,	$1 38
Sowing 6 cts., and harrowing in 38 cts.,	44
Seed,	25
Harvesting and housing,	1 00
Threshing,	50
Cleaning and delivering,	50
Interest on the value of land, at $50,	3 50
	7 57
Product—Seventeen bushels of clean seed, at 50 cts.,	8 50
Profit, per acre,	$0 93

Rye.

Cost—Plowing and harrowing, twice,		$2 76
Sowing and harrowing in,		44
Seed, two bushels, at 62½ cts.,		1 25
Harvesting and housing,		1 00
Threshing 12 bushels, at 8 cts.,		96
Delivering,		20
Interest on value of land,		3 50
		10 11
Product—Twelve bushels rye, at 70 cts.,	$8 40	
Two tons straw,	5 00	
		13 40
Profit, per acre,		$3 29

Digitized by Google

Indian Corn.

Cost—Plowing and harrowing, twice,			$2 76
Half of 30 loads of manure, at 12½ cts. per load,			1 88
Hauling and distributing manure,			1 50
Planting,			1 40
Seed, five quarts,			20
First, second and third hoeing,			1 95
Cutting and stouting,			1 00
Husking and housing, at 3 cts. per bushel,			96
Shelling and delivering,			50
Interest on value of land, at $50 per acre,			3 50
			15 65
Product—Thirty-two bushels, at 50 cts.,		$16 00	
Two tons of fodder,		5 00	
			21 00
Profit, per acre,			$5 35

Hay.

Cost—Top dressing,		$1 00
Cutting and making,		2 00
		3 00
Interest on the value of the land,		3 50
		6 50
Product—Two tons hay, at $6.00,		12 00
Profit, per acre,		$5 50

The many incidental profits from butter and cheese, milk, dried fruits, honey, poultry and manure, may be set off against the value of the feed and care of the stock; allowing these items to balance, the following general estimate may be made for a farm of one hundred acres:

Profit on 25	acres of	wheat, at	$12.30,	$307 50
5	"	barley,	84,	4 20
5	"	oats,	2.58,	7 20
1	"	buckwheat,	93,	93
1	"	rye,	3.29,	3 29
15	"	corn,	5.35,	80 25
15	"	hay,	6.00,	90 00

Digitized by Google

Profit on 8 acres of pasture,	00,.....	0 00
25 " fallow,	00,.....	0 00
100 acres gives a nett profit of.....		$493 37

It will be seen that this profit is equal to a fraction more than $9\frac{86}{100}$ per cent. on the value of the land at fifty dollars per acre, after allowing seven per cent. for the capital invested, which is added to the cost of production on each article.

It must be remembered, also, that the above estimate is made on the average products of the county, by which the good farmer is brought to a level with the indifferent cultivator, and the careless, reckless man, is elevated to the same position. It is well known that the usual crops of a careful cultivator are usually over—

25	bushels of	wheat	per acre
32	"	barley	"
45	"	oats	"
20	"	rye	"
20	"	buckwheat	"
60	"	Indian corn	"

If, then, the estimate of profits is made on these products per acre, a farm of one hundred acres would yield a nett profit to the proprietor as follows:

On 25 acres of wheat,.....	$432 50
5 " barley,.....	31 70
5 " oats,.....	17 00
1 " buckwheat,.....	2 43
1 " rye,.....	8 89
15 " Indian corn,.....	290 25
15 " hay,.....	90 00
8 " pasture,.....	0 00
25 " fallow,.....	0 00
100 acres, well cultivated, gives a profit,.....	$872 77

In this case good cultivation gives a *nett* profit of $17\frac{45}{100}$ per cent. on the value of the land, over and above the cost for use of capital invested. If a more minute estimate of profit is desired, an allowance should be made for the use of capital invested in stock, machinery and implements, and also for annual deterioration, or wear and tear. The nett profit, as here estimated, is the excess of value of products, over the cost of labor or exertion,

Digitized by Google

and over the legal value of capital occupied in farming, whether it be held in the shape of land, stock or implements. (See the article "Labor," page 555.) It is from this excess, that the farmer provides the comforts and enjoyments of his household; he finds contentment, a happy condition, into which neither avarice nor covetousness can find entrance; where happiness dwells in fullness of heart, he contemplates the many mercies received and enjoyed, counting them as a shadowed foretaste of that blessedness which is promised to the upright man, as without measure and without end.

Labor and Wages.

Labor or human exertion is the chief source of income; the only reliable source of wealth. *Labor* is the price, the first price of all things, for man is compelled to adapt his labor to production, that he may secure a continuance of life, and increase his comfort and happiness.

The objects upon which man applies his labor are, the earth with its elements, and to which by degrees are added, stock and utensils, and these constitute *capital.* These are fundamental truths, and invariable for it matters not how labor is applied, whether in agriculture or manufactures; in commerce or trade; the principal remains constant, that labor is the first price of all things.

The value of labor fluctuates, and the value of capital fluctuates, according to the capacity of man to extend or increase productiveness, and to effect the distribution of the products of their capacity. Wages is the compensation given for the industry and skill applied to production, distribution and consumption of all commodities.

Without attempting here to examine into the principles of political economy, it may be sufficient to state that, founded upon the experience and intelligence of the people, a law exists in this State fixing, or arbitrarily establishing the value of the use of money, at seven per cent. per annum. Money in coin has no value in itself beyond the price of the metal and the labor applied to give it form, ornament and distribution; but the convenience of man for the interchange of commodities, has caused a conventional agreement whereby money i. e. gold and silver is made the *representative* of capital, whether it be land, stock, or implements and utensils; and by a more recent arrangement, the promissory obligations of companies of individuals, are made to represent gold and silver coin.

An income of seven per cent. per annum is equivalent to a rent of that value from any source, and is a measure of value, so long as the law continues in force, whereby labor and wages may be estimated.

It is important for the farmer fully to understand the quantum of labor or

Digitized by Google

exertion which can be expended in a given time, without injuring the human frame. It is important for him to understand the *value* of his annual products, and the proportion such value bears to the arbitrary legal annual value of capital he holds in the shape of lands, stock, implements, utensils and wages: the excess beyond this value is accumulation or profit.

It must be apparent that in the early settlement of the county of Seneca, the population being thin, and each dwelling far distant from another, the proprietors received a comparatively small proportion of the value of their crops, because the price of labor, the cost of distribution, and value of capital invested, consumed nearly the whole of that value.

As the stream of population poured in upon the county, lands were in demand, and as the supply diminished, the value increased, and with it the value of all products was enhanced. As the wants of the people increased, labor was applied with better effect, producing a greater amount of products from the same area. The proprietor did not receive any greater *proportion* of the products than formerly, because the cost of labor and distribution was not diminished, yet he received a better income or value from the capital invested, because the quantity he did receive bearing a higher value, enabled him to command a greater variety of comforts in exchange for his products. The laborer, however, received less, inasmuch as the products being higher in value, his labor received in exchange a less proportion of the products.

Labor fluctuates in value like commodities, in proportion to the supply; the compensation for labor, is at times depressed below its natural value from temporary causes, such as an influx from emigration, or objects of speculative desire, but as these causes are temporary or artificial they never endure but for a time, and the principles above named maintain their steadfast power.

It must be apparent that though the value of labor, or wages, may maintain as high a rate as heretofore, it is nominal as regards the laborer, for his food, fuel and other comforts consume a larger portion of his exertions: this however, is in some measure balanced by the usually diminished cost of his shelter, clothing and foreign commodities. The interest and welfare of the county of Seneca are so intimately connected and blended with the principles which govern labor and wages, it behooves every man who would thrive and act justly, who would mete out to his fellow creatures a fair compensation for their labor or exertions, not grudgingly or of necessity; it behooves every such man to examine and study these principles; the laboring man should be aided in comprehending the true source of his compensation, and the means by which his wages can be sustained.

Digitized by Google

A clear and certain course of action for this object is to be found in a diffusion of good habits, industry, and especially a careful dissemination of knowledge among the people. These are the best and surest *means* for sustaining wages at a rate which shall give to the laborer a fair proportion of annual products.

No artificial, arbitrary, or conventional aids will ever sustain labor, or give it character; all reliance upon other means than personal exertion for self-support lead to degradation, and to the seeking after accumulation by speculative objects or views, as groundless and futile as chance.

It has been said that the unnatural appetite for wealth must be abated as a nuisance, before agricultural labor will be as well rewarded as misemployed intellect; severely true as this may be, to some extent, it seems to prove the necessity of removing that ignorance, which is the foster mother of the diseased appetite; and to eradicate the cancerous desire to acquire property, without producing it.

It has been shown that labor is the source of all exchangeable products, consequently the source of all wealth. Labor has within sixty years changed the forests of Seneca county into rich, productive fields. Labor has driven the "western limit" from the waters of Seneca lake to the Rocky Mountains, studding the intervening country with villages, towns and cities; and even now, at this day, the western limit flying before human exertion has reached the shores of the Pacific ocean.

The subject of labor and wages is full of interest and importance to the agriculturist, and is entitled to more consideration than is consistent with the limits of this work; with a view to the better comprehension of its bearings and as data for contemplation introductory to its examination, the foregoing observations have been made and the following practical remarks are given as the character and uses of agricultural labor in the county of Seneca. Farm operations are carried on either,

1st. By laborers who engage to perform all required services, for their board and lodging and a stipulated amount of money, for the fixed period of one year.

2d. By laborers who engage on similar conditions, from month to month, or less periods than a year.

3d. By laborers who engage to work by the day.

4th. By laborers who undertake to perform specific work, in a given time, and for a certain sum of money.

These several methods have their peculiar advantages, but as a general rule, where a farmer conducts his operations with system, order and economy, the yearly laborer is the most serviceable and reliable. The quantum of

Digitized by Google

exertion can be regulated by the business of the farm; and here it may be remarked as a general rule, the labor of a man, a boy and two horses are necessary for the thorough cultivation of every hundred acres. This quantum of labor should ever be considered as the minimum proportion, for a more parsimonious system, is usually attended by indifferent crops, a weedy farm, and denial of many essential domestic comforts and enjoyments.

To laborers employed by the year may be committed the care of all stock; they will thrive under steady, unchanged attention. Such laborers being under the immediate and constant supervision and influence of the proprietor, are generally more attentive to their duties, and of a higher moral character than the floating class of men.

The second class of laborers, or those who engage by the month only, having no continuous interest in the affairs of the employer, may not be relied on, to the same extent as men hired by the year. Doubtless there are men who adopt this mode of applying their labor from uncontrolable circumstances and often prove to be worthy of all confidence, yet as a general rule this class is actuated by a restless spirit, roving and wandering from place to place, eagerly seeking advantage from the unwary, and sinking from year to year into want and wretchedness.

Day laborers, and job laborers form the third and fourth class. When a sufficient number of men can be collected and employed by the day, or to perform a specific work, farming can be conducted with more care and economy; for particular work can then be accomplished at any given period with more effect and in less time. Such men working by the job exert themselves greatly, with the desire of gain, but with men thus employed; there is no sympathy, no bond of union between them and the employer, they come and go at their pleasure, and too often are disposed to waste time, to perform as small a portion of labor as may be, and are ever clamorous for as large or larger compensation than the most steady thorough-bred farmer.

The annual laborer is therefore more serviceable to the agriculturist than any other class of assistants; between them exists a closer relation, it is in a degree a social relation; a lively interest is inculcated in the welfare of each, and where kind feelings and just treatment prevail, respect and regard are enlisted for the employer; order, system and morality are habitual, content and happiness characterise alike every passing month.

The rates of wages for labor in the county of Seneca vary from eight to ten dollars per month, for men when employed by the year. Twelve dollars per month are paid to men engaged for one to four months. Fifty cents per day to daily laborers.

Digitized by Google

To all persons engaged for the periods above named, their board and lodging is provided at the cost of the farmer.

The wages of female labor is from fifty cents to one dollar per week according to the capacity or employment of the person; board and lodging at the cost of the farmer.

Agricultural Societies, Fairs, &c.

A characteristic feature of the farmer's life and occupation is, the moral associations which arise and are fostered in every good mind. The success of a neighbor is hailed joyfully, as connected with the success of all; while misfortune commands his sympathy, and a willing hand is ready to aid in the restoration of a fallen friend. The knowledge of the farmer, whether derived from study or observation and confirmed by practice, is common stock; there is no monopoly of agricultural improvements, neither does envy or jealousy ever rankle in the breast of an honest and true farmer, seeking for advancement in his laborious calling. The fair and upright agriculturist advances steadily in the estimation of his fellow men, his products increase, and he becomes unconsciously the benefactor of his town, his county, and his State. Among such men, emulation is a source of pure gratification, and enjoyment flows to all who strive to produce the greatest amount of good from the resources placed at their command by the all wise and benevolent Creator.

This natural desire to excel, or to equal the best, is praiseworthy and noble; and to this desire may be in some measure ascribed the present healthy condition of the Seneca County Agricultural Society. There is a wide distinction between societies of farmers under the existing statute, and other associations of men. In many, and perhaps most societies, men strive to keep knowledge to themselves, charging a fee or price for its use, or surrounding it with ceremonies and mysteries obstructing free access. This is often done under the mistaken idea that the distribution would diminish their store, and interfere with their welfare: not so with agricultural societies, their chief aim is to collect knowledge for gratuitous and wide dissemination.

The folly of hoarding and withholding knowledge by rules and restrictions, must be evident from the fact that the possessor is not less rich by giving it away. No, he is as wealthy as ever, even though he has made hundreds as rich as himself; in one sense he receives a rich reward, for he obtains distinction for the imparted knowledge, a distinction which every liberal benefactor is sure to receive from his fellows. Both men and societies are benefited by the free distribution of knowledge, for by knowledge they obtain power, not only the power to perform and the power which distinction grants,

Digitized by Google

but also the power to govern; for the greater knowledge necessarily controls the lesser.

The action and design of the national patent office indicates strongly the desire of men to keep knowledge to themselves, vainly supposing the discovery of a new principle; and in, perhaps, a majority of cases, the same office proves that man, ranging in a circle, does but stumble on some thought which has been conceived before, yet in the lapse of time and love of change, is covered with dust and forgotten.

Nature's principles ever remain the same: man comes into the world ignorant and helpless; from the moment of his birth he accumulates knowledge by the sense of feeling and of sight. In time he is able to reason, then to investigate; and though his years be prolonged to three score and ten, yet there is scant time for the strongest mind to embrace more than a small number of Nature's principles. As these principles are unchanging, the most vigorous mind soonest comprehends such as are brought within its scope, and endeavors to apply them to useful purposes. Age after age these efforts are the same, as is often manifested at the patent office, where continued applications are made to secure results of long and toilsome investigations, doomed to disappointment by the recorded history of similar labors with like results, overloading the record pages of the department.

The aim, then, of farmers, should be to avoid the fruitless attempt to discover *new* principles, for such are not, but by investigation and research to comprehend and act upon principles established from the beginning by an allwise power; and when, by study and patience, he has learned to increase his crops to twice their present yield by an undeviating rule, then freely to give of that knowledge: his reward will be abundance and distinction, his wealth cannot and will not be impaired by the equal success of others, for success in agriculture encourages success in every other industrial occupation, ever creating additional sources for a greater demand of products; his distinction, if meekly borne, will be an abiding honorable estimation among his countrymen.

Men thus actuated, when collected in associations or societies, stimulate all within their influence to improvement and increase, to competence and happiness. The reverse of this picture need not be drawn, it is the downhill road, rapid in descent, leading direct to error and wretchedness.

The Seneca County Agricultural Society is supported by farmers and mechanics, and for several years with spirit and zeal. The annual celebrations are held in one of the principal villages, as early in the autumn as convenience will permit, after the harvest has been secured; when the farmer, with his

Digitized by Google

wife, his sons and daughters, encourage and enliven by their presence this joyous festival.

So great is the asssemblage at the annual fair, that at a recent meeting of the society in the town of Ovid, neither church nor court house could contain the throng; and when, on the second day, the hour arrived for the annual address, the crowd hastened to the public square, where the speaker* held the dense mass in stedfast attention for more than one hour.

During the earlier days of the society, the farmers were distrustful of the benefits to be derived from it; but as years rolled on, facts were disclosed among the members tending to insure an increase of products, with less risk of a failure in crops, and a better cultivation of the soil with less outlay of money. At this day its utility is admitted, and every prudent farmer feels the propriety and necessity for its support and success.

The limited patronage derived from the State is well bestowed, forming one of the links in a chain which voluntarily unites the hearts of the people to the concentrated power they have delegated to the few, to be cautiously used for the good of all. They view this patronage as an expression of good will to a class whose numerical superiority over all others gives not only the sustaining power of life, but also the main moral and physical support of the government. The benefits to the State arising from the county societies are great and enduring, for every effort which increases the agricultural products, gives increase to all industrial occupations, thereby indirectly inducing an increase of population, and directly increasing the wealth and prosperity of the State.

The premiums offered by the county society on stock, improved farm cultivation, on crops, and other pursuits of industry, are bestowed with judgment and good discretion, although attention to useful and important details is neglected. In the classes of live stock, every animal offered for the premium should be registered accurately on the books of the society, with a history or statement of its age, parentage, and weight. If a cow, the qualities for milk and butter and her breed, should be added; the times of calving, and the character of her calves; the quantity of milk given per twenty-four hours, per week and month for a given period, by weight or measure; the amount of cheese and butter in any given time from an ascertained quantity of milk or cream, and the duration of her milking period: all these and like details should be recorded. The history of each bull, ox, cow, horse, and every other class of animals offered for premium, would in a few years form a deposit of facts most useful to every careful farmer, and it ought to be so

* Prof. John P. Norton.

Digitized by Google

arranged by an index that an easy reference could be had at all times to the character of any and every animal therein recorded.

Another improvement may be suggested in the application of premiums to crops, and the suggestion here made applies with equal force to the practice of the State Agricultural society. Under the present system a judgment is formed upon the produce of two acres, or in some cases on five acres of grain, though generally on the merits of two acres. It must be evident that accidental circumstances may affect favorably a small portion of land, without the exercise of skill or labor, and thus give an unjust advantage to design over merit.

Natural beauty of position or an unusual outlay of capital, may give great additional value to an estate, yet these efforts do not fall within the legitimate object of a county society, on which to bestow premiums. The award should be for skill, judgment, economy, system and success in the aggregate, and not in part: on the whole crop of wheat, barley, rye, oats or corn, or any other product, not on any two selected acres

The quantity per acre of the crop will generally offer the best test of a farmer's skill. If ten acres be the minimum area for a large premium on grain, it will avoid the accidental or chance advantages alluded to.

It may be that many good cultivators do not sow so large an area of grain (ten acres.) As no man should be excluded from competition, a premium not materially variant from the former should be offered for areas of grain not exceeding ten, nor less than four acres, thus covering the whole subject as regards grain crops, and more fairly testing agricultural skill, economy, system and success.

The record of all such crops offered for the Society's premiums should be clearly and distinctly recorded for easy reference, that all who desire it, may know *how* the best crops are raised, and by whom. As in regard to grain and other crops, so likewise in relation to all kinds of stock. These specific records of origin, care, weight, mode of production, and feeding, and quantity and quality of intended results, and the economy practiced in each case, should form the basis of reward, and one means of disseminating useful information.

Grain being the staple and important product of western New-York, it necessarily holds a high place in the estimation of the farmer. Yet wool is an article hardly less essential to the comfort of man, and may reasonably and profitably command more attention in this county than is bestowed upon it. Higher premiums might advantageously be offered on sheep husbandry, especially on *wool*. The manner of feeding sheep in winter and summer, with an accurate estimate of the cost, should be carefully stated by all who

Digitized by Google

offer sheep in competition. The average loss in any given number of sheep and of the lambs, should be stated; also the proportion of sheep to the pasture they occupy, the value of the different breeds for wool and for mutton, and the profits derived from each. These are important items for comparison, and need to be more generally known.

Mechanism is well encouraged. The farmer feels that the science of mechanics, the proper application of power, and direction of motion, are no less essential than important for the economical pursuit and practice of his vocation, as well as their successful issue. By the skill and aid of the mechanic he is able to turn the soil rapidly, to divide it finely, to produce more abundant crops, and as a consequence he can afford to supply the consumer at less cost. Thus from year to year the direct labors of the farmer and mechanic augment the domestic comforts of the whole people, enriching the State. To mechanism therefore it is judicious to offer attractive premiums. It would be well also to offer premiums for carefully conducted *experiments*. Thought and reflection are the parents of experiment, and practice is but the effect of multiplied experiments. It will be admitted by observing men, that experimenters are too often governed by fancy, by ideas not derived from knowledge, nor any principle of nature. It follows as a consequence that a number of men who style themselves "practical men, or practical farmers," are frequently very indifferent cultivators, because they practice systems founded on experiment only, without the basis of the principles of nature to guide and direct them. Practice is essential; it is indispensable in all the labors of the farm, but when applied to the production of vegetable matter, with a view to its greatest quantity at the least cost, it requires the additional aid of study, critical examination of the soils used, and the plants to be raised. It needs an intimate knowledge of their elements, and of their food and diseases. To attain this knowledge no man's life is of sufficient span, if confined to experiment and practice only. The experience therefore of the practical farmer without study, is of no abiding value. It is walking in shadow, or with a dim light. These shadows and obscurities are rapidly passing away by the force of intelligence, characteristic of this age. Education is easily obtained, its value is understood, and its first fruits are to teach men to think, to reason, to investigate. It points out the ready sources of knowledge applicable to his occupation; it provides for him well established principles and facts to guide him in a path free from doubt or uncertainty. It is within a short period of years that the light of science has thus brightened the life and prospects of the agricultural classes of men; yet now the stream of inquiry into cause and effect is incessant, rendering the life and labors of the young

Digitized by Google

who are springing into active life, less onerous and more productive than were the days of their sires.

This stimulus is perhaps the origin and spirit of the county fairs. There mind meets mind throbbing with like impulses, giving and receiving the results of thought verified by practice. There experiments should be recorded, that enterprise may be encouraged, that thoughts may be embodied, giving to them a form available to every inquirer.

A commendable feature in the action of the Seneca County Society is, the endeavor to stimulate the production of agricultural commodities in such proportions, that no import of any farm product may occur within the limits of the county; so to increase the lesser crops and improve the larger that an excess of each kind shall form an object of export. This aim is surely legitimate and sound. It deserves the zealous support and co-operation of every farmer who loves his home, or who would add to the general welfare, because it is this excess of products above the wants of the people, which enriches the county, by augmenting largely the value of every farm.

It will be seen by an examination of facts in this survey, that the dairy stock, and stock generally may be profitably increased. Swine and sheep also are objects for more attention. Pasture lands may be increased without encroachment on the area devoted to grain, as a portion of the unimproved acres can be brought into useful cultivation. Every grain crop may be materially increased, not by an extension of area, but by better cultivation. There are some portions of the county which do not yield more than a ton and a half of poor hay to the acre. Such land might be worked more profitably by raising root crops, yielding, with moderate care, from six to twelve tons of fodder.

Many of these objects have engaged the attention of members of the society, which if carried out as contemplated, must cause a high state of cultivation, and be gratifying to the farmers of the county.

In bringing this division of the survey to a close, it seems appropriate to add the proceedings of the county society for the year 1850. They will serve to compare the present condition and action of the county with the past, and it may be they will serve as a beacon light in time to come.

Digitized by Google

PROCEEDINGS OF THE SENECA COUNTY AGRICULTURAL SOCIETY, 1850.

The pleasant and profitable meeting of farmers at the annual celebration in the preceding October, induced a more numerous attendance than is usual at the winter meeting, which was convened by public notice at the Eagle Tavern, in Waterloo, on the 31st day of January, 1850. The President acting as Vice President of the State Society, being in attendance at their annual meeting in Albany; Dr. JOHN L. EASTMAN, of Lodi, was called to the chair and WM. F. COAN acted as Secretary.

The objects for competition at the winter meeting are generally grain, grass, and other seeds, and flour. The committees having performed their several duties, presented their reports and award of premiums, which were confirmed by the Society and directed to be paid from the treasury, as follows:

For the best five acres of wheat averaging 41 1-6 bushels per acre, to P. J. Van Vleet, Romulus, $15.

For the best acre of corn, 54 28-75 bushels in grain from the acre to Eben. S. Bartlett, Romulus, $5.

For the best three acres of barley, 36 bushels from each acre, to Alexander Rorison, of Fayette, $3.

For the best barrel of flour to N. H. Wickoff & Co., Lodi, $5.

For the largest quantity of clover seed per acre, being 10½ bushels on 5½ acres, to Alexander Rorison, $3.

A certificate was presented from Messrs. N. H. Wickoff & Co., stating that the barrel of flour presented by them was made from a grain known by the name of Stokum wheat, which weighed sixty-five and a half pounds per bushel.*

Sixty pounds of this Stokum wheat produced,

48	pounds	2	ounces	of superfine flour.
8	"	1	"	fine "
2	"	5	"	cornell "
6	"	0	"	bran and shorts.
0	"	8	"	waste.

This wheat yields therefore, a barrel of superfine flour from about four bushels and four pounds, and a yield of flour, fine and superfine, equal to one barrel from three bushels and fifty pounds of the grain.

The field of wheat offered by Mr. Peter J. Van Vleet, of Romulus,

* A specimen of the Stokum wheat plant and of the grain is deposited in the Museum of the State Agricultural Society, Albany.

Digitized by Google

seems to offer great encouragement to the farmers of the county: it is well known that Mr. Van Vleet is a prudent and careful farmer, possessing an excellent soil; but it is evident that his soil obtains at his hand a due proportion of vegetable matter and the due quantity of mineral matters essential for wheat; his certificate shows that six acres of the field were broken up in 1847, and covered with twenty loads of barn-yard manure to each acre, the remaining four acres being a timothy sod, were fallowed in 1848, and the whole field was covered with thirty loads of barn-yard manure upon each acre. The seed sown was the Hutchinson and Soule's varieties, and the product as stated, forty-one bushels and ten pounds from each acre.

It is not stated how the manure was made, nor whether the liquid portions were systematically preserved, facts important to ascertain, as having a strong influence on the wheat crop.

The expense of cultivating this field was $147.63, or about $14\frac{80}{100}$ dollars per acre. The produce was sold at 8s 9d per bushel, giving $462.29, or a nett profit of $30\frac{15}{100}$ dollars per acre.

If this was an isolated case it could not be held up with confidence to farmers, as a point to be reached by industry and study; but it is not isolated, very many farmers in the county have done the like. There is reason to believe that on the good wheat lands, there are several thousand acres, which may be made at moderate expense to produce crops equal to Mr. Van Vleet's.

The transactions of the County Society for the year 1849, printed in pamphlet form, were directed to be distributed among the Vice Presidents of the several towns for sale, and the proceeds to be paid to the treasurer.

An election for officers to serve for the year 1850, was held, and the following persons were elected: JOHN DELAFIELD, of Fayette, *President*. Israel Lisk, Junius; Richard P. Hunt, Waterloo; Francis Yost, Fayette; Peter J. Van Vleet, Romulus; Jason Smith, Tyre; Lyman P. Crowell, Seneca Falls; Joseph Wickoff, Varick; James De Mott, Ovid; Nelson Noble, Covert; *Vice Presidents*. John D. Coe, *Treasurer*. Henry D. Didama, *Secretary*.

The Executive Committee and the members and friends of the Society were requested by notice from the President to attend a meeting at Roger's Hotel, Rose Hill, on the 21st March, the objects being to determine the place for celebrating the next annual fair; to arrange the premium list, and transact such other business as the interests of the Society might require.

The members and others assembled, and the President took the chair at 11 o'clock, A. M. Committees were in attendance from the villages of Seneca Falls, Waterloo and Ovid, with proposals from each place to hold

Digitized by Google

the celebration of the next annual fair in their respective villages; the proposals were presented to the President, when it appeared and was declared that, Seneca Falls offered one hundred and twenty-five dollars as a contribution to the funds of the Society if the fair was held in that village. Waterloo offered the sum of two hundred and twenty-seven dollars; and Ovid offered two hundred and fifty-one dollars; whereupon it was ordered that the annual fair be held on the 26th and 27th of September, 1850 at Ovid. The following premiums were ordered, committees appointed, and lists directed to be published, and in the following form:

Seneca County Agricultural Society Fair and Cattle Show, for 1850, *will be celebrated at Ovid on Thursday and Friday, the 26th and 27th of September*, 1850.

The Society presents the following list of premiums to be awarded to the successful competitors at the celebration of the County Fair, to be held at Ovid, on Thursday and Friday, the 26th and 27th of September, 1850.

FARMS.

For the best managed farm,..... Diploma, and a subsoil plow.
For the second best,..... $5 00
For the third best,..... 3 00

The visiting committee, viz: Wm. F. Coan, chairman; Stephen Ludlum, and Jacob L. Marshall, will visit any farm to which they may be invited for examination, in the months of June and July, provided that notice be given to the chairman, through the Townsendville post office, on or before the first day of June.

GRAIN.

For the best five acres of wheat, not less than forty bushels per acre,..... Diploma and $15 00
For the best crop of winter wheat, not less than ten acres, ... 10 00
do five acres of winter wheat, ... 8 00
do three acres of spring wheat, ... 3 00
do do rye,..... 3 00
do five acres of Indian corn, not less than 75 bushels per acre, in the ear; each and every bushel to weigh not less than 75 pounds,..... 10 00
For the best acre of Indian corn in the ear, each and every bushel not to weigh less than seventy-five pounds,..... 5 00
For the best three acres of oats, not less than sixty bushels to the acre, ... 3 00
For the best three acres of barley, not less than forty bushels to the acre, ... 3 00

Digitized by Google

For the best acre of buckwheat,..... $3 00
For the best acre of peas,..... 3 00

FLOUR.

For the best barrel of flour, produced from unmixed wheat grown in Seneca county,..... Diploma and 10 00

The object of the society in offering this premium is, to ascertain and make known the best wheat for profitable cultivation on the soils of our several towns. Every person presenting flour for this premium, must prepare and place with the president a statement setting forth:

1st. The weight of the wheat per bushel, and the town in which it was grown, and the name by which it is generally known.

2d. The products of a specific quantity of the same wheat when ground, specifying the quantity of inspected flour, by weight, the quantity of bran by weight, the quantity of seconds by weight, the quantity of —— by weight, the quantity of waste, if any, by weight.

As the quantity of flour produced from wheat varies according to its quality, it is hoped that each variety cultivated in this county will be subjected to trial, and it is requested that a sample of the wheat equal to two pounds in weight, be deposited with the president, with the necessary statements.

GRASS SEEDS AND ROOTS.

For the largest quantity of good clover seed per acre,..... $3 00
do do timothy seed per acre, ... 3 00
For the best acre of potatoes, not less than 300 bushels per acre, 3 00
do half acre of ruta bagas,..... 3 00
do quarter acre of beets, ... 2 00
do do carrots,..... 2 00

The committee on grain, flour, grass seeds and roots, will visit any growing crops, if invited, and report on the cultivation as well as products. Notice to be sent to the chairman, T. J. Folwell, through the Romulus post office, on or before the first of June. In order to give ample time for housing, cleaning, and threshing crops, and making flour, the committee will examine the products at the next winter meeting.

HORSES.

For the best stallion which shall have been kept in the county not less than six consecutive months prior to October, 1850,.... Diploma and $10 00
For the second best stallion, under the same restriction,..... 5 00
For the best mare and sucking colt, ... 8 00
For the second best mare and sucking colt, ... 4 00
For the best pair of matched horses, raised in the county,..... 5 00

Digitized by Google

For the best single horse raised in the county, ...	$5 00
For the best three year old colt raised in the county,.....	2 00
do two year old colt do	2 00
do one year old colt do	2 00

CATTLE.

For the best bull two years old and upwards,..... Diploma and	$8 00
For the second best bull two years old and upwards,.....	2 00
For the best one year old bull, ...	2 00
For the best milch cow,.....	5 00
For the second best milch cow, ...	3 00
For the best yoke of working oxen,.....	5 00
For the best five yoke of working oxen from any one town,.....	10 00
For the best pair of three year old steers,.....	3 00
do two do	3 00
do one do	2 00
For the best two year old heifer,.....	3 00
For the best one year old heifer,.....	3 00
For the best bull calf, ...	2 00
For the best heifer calf,.....	2 00

FATTED CATTLE.

For the best pair of fatted cattle, of any age, ... Diploma and	6 00
do three year old steers,.....	4 00
For the best fatted cow,..... Diploma and	3 00

SHEEP.

For the best Merino buck,..... Diploma and	3 00
do Saxony buck,..... Diploma and	3 00
do six Merino ewes,.....	3 00
do six Saxony ewes,.....	3 00
do six long wooled sheep, with special reference to the carcase as producing the best mutton,.....	3 00

The committee on sheep will, in their examination, have regard to the form and size of each animal, as well as to the quality of the wool.

SWINE.

For the best boar,..... Diploma and	$3 00
do sow, ...	2 00
do litter of pigs, not less than six in number, and not over six months,.....	2 00

POULTRY.

For the best pair of fowls,.....	1 00
do capons,.....	2 00

Digitized by Google

For the best pair of turkeys,		$1 00
do ducks,		1 00
do geese,		1 00
For the best collection of poultry,		3 00

HOUSEHOLD PRODUCTS.

For the best sample of butter, not less than 25 lbs.,	Diploma and	5 00
For the second best sample, do		3 00
For the third best sample, do		1 00
For the best cheese, not less than 20 pounds,	Diploma and	5 00
For second best do do		3 00
For the best woolen carpet, not less than 20 yards,		2 00
For the best rag do do	Transactions.	
do woolen hose,	Transactions.	
do worsted hose,	Transactions.	
do woolen mittens,	Transactions.	
do half dozen linen grain bags,		1 00
do do twilled cotton grain bags,		1 00
do sample of maple sugar, not less than 25 pounds,		2 00
For the second best sample do do	Transactions.	
For the best sample of honey, not less than 20 pounds,		2 00
For the second best sample,	Transactions.	

WHEELED CARRIAGES.

For the best farm wagon,	Diploma and	$5 00
For the second best do		2 00
For the best two horse pleasure carriage,	Diploma and	3 00
For the best buggy wagon,		2 00
For the second best do		1 00

MACHINERY AND MECHANICS.

For the best self-cleaning threshing mill,	Diploma and	2 00
do horse power,	Diploma and	3 00
do fanning mill,		3 00
do straw and stalk cutter,		2 00
do churn,	Transactions.	
do farm gate,	Transactions.	
do two pairs of coarse boots,	Transactions.	
do do shoes,	Transactions.	
do draught harness,	Transactions.	
do single harness,	Transactions.	
do horse shoe,	Transactions.	

Digitized by Google

For the best method for hanging grindstones,..... Transactions.
do bee hive,..... Transactions.
do grain drill,..... $3 00
do corn planter,..... 1 00

IMPLEMENTS AND TOOLS.

For the best plow,..... 3 00
do subsoil plow,..... 3 00
do harrow,..... 2 00
do fallow cultivator,..... 2 00
do horse rake,..... 1 00
do grain cradle, hung for use,..... 1 00
do clover cradle, do 1 00
do grass scythe, do ..... Transactions.
do ox yoke,..... 1 00
do corn hoe,..... Transactions.
do grubbing hoe,..... Transactions.
do set of dairy utensils,..... 2 00

The farmers, mechanics, and others are invited to send for exhibition, whether for premium or not, any improved implement or machine, agricultural or household.

This branch has become so important to our interests, that the premium list has been extended, and the society will feel desirous of rewarding or encouraging ingenuity and skill as far as their means will permit.

For the best machine for making drain pipes and tiles, Diploma and $10 00
For the best collection of tiles and pipes for draining,..... 3 00
For the best set of tools for ditching,..... 5 00

FRUITS, FLOWERS AND VEGETABLES.

For the largest and best assortment of table apples, six specimens at least, of each variety,..... Diploma and $2 00
For the second best do.,..... 1 00
For the best assortment of pears, six specimens at least of each variety,..... 1 00
For the best twelve quinces,..... Transactions.
For the best assortment of peaches, six specimens at least of each variety,..... 1 00
For the best collection of grapes, six bunches of each variety,.... 1 00
do best six pumpkins,..... 1 00
do best six squashes,..... 1 00
do best six cabbages,..... 1 00
do most extensive assortment of culinary vegetables,..... 1 00

Digitized by Google

For the greatest variety and quantity of flowers, ... Diploma.
do best designed floral ornament,.....Loudon's Ladies' Flower Comp.
do best bouquet,..... Treatise on Roses.
do finest single flower,..... "

Show cases for fruit, &c., will be provided by the committee of arrangements.

Garden vegetables of all kinds are worthy of more attention than they have hitherto received. The sweet potato is found to ripen in this county; celery, tomatoes, and other plants, succeed well. It is hoped that specimens of garden vegetables will be found upon the tables, and premiums will be awarded by the society, as far as their funds will permit.

THE PLOWING MATCH.

For the most approved specimen of plowing with horses or oxen, and without a driver,..... $5 00
For the second best,..... 4 00
do third best,..... 3 00
do fourth best,..... 2 00
do fifth best, ... 1 00
To the person under 18 years of age, who may not have entered on the above list, and who shall produce the best specimen of plowing with horses or oxen, and without a driver, ... 3 00
To the second best, ... 2 00
do third best,..... 1 00

The quantity of ground measured off to each competitor will be one quarter of an acre. The time allowed is two hours. The depth of the furrow is not to be less than seven inches.

To the person who shall exhibit the best specimen of *sub-soil* plowing, not less than thirteen inches deep, nor less than one quarter of an acre,.. $5 00

The competitors must be early on the ground, that all may draw for their stations at the same time; and no plow or team shall be entered after the station numbers are so drawn.

DISCRETIONARY PREMIUMS.

A sum of money will be placed with the committee, to be awarded to persons presenting objects of ingenuity, and such objects as are labor-saving, or economical and profitable in their use and application, and such as are not named in the foregoing list.

RULES AND REGULATIONS.

1. Each person claiming a premium, must comply with the statute (of 1848,) "by delivering to the President of the Society, an accurate de-

Digitized by Google

scription of the process in preparing the soil, including the quantity and quality of manure applied in raising the crop, and the kind and quantity of food in feeding the animal, as may be; also, the expense and product of the crop, or increase of value in the animal, with a view of showing accurately the profit of cultivating the crop, or of feeding or fattening the animal."

2. Each person offering grain, roots, or seeds, must produce at least one bushel of such grain, roots, or seeds, for exhibition and examination, and must at the same time, produce and leave with the President, a true statement of the quantity raised per acre, by weight and measurement; also, of the measurement of the land on which the same were respectively grown.

3. All animals presented for premiums must be owned and kept for use within the county. No animal, after receiving a first premium, shall again compete for a premium in the same class.

4. All working cattle offered for premium, must have been worked within the county at least five consecutive months prior to October, 1850.

5. All agricultural products must be raised within the county.

6. No mechanical or household productions, which have received a premium, may be presented again for competition.

7. Mechanical productions, which are not offered by the *manufacturer*, shall not be entitled to a premium, unless the circumstances of the case are such that the viewing committee may deem it expedient and right.

8. Competitors for premiums must be residents of the county, and members of the society. A payment of one dollar to the treasurer constitutes a member.

9. All persons intending to exhibit animals, are requested to notify the Clerk of the Fair, or the Secretary, a week before the Fair, as to their number and kinds, that convenient stalls or pens may be provided.

10. It is desirable to have all machinery and mechanical productions on the ground, one day before the Fair, to be advantageously arranged.

11. Every animal, all products, and every object intended for exhibition, must be recorded by the Clerk of the Fair, who will deliver the necessary tickets or labels.

No entry can be made after 12 o'clock, on Thursday, the 26th of September. The Clerk will close his books at that hour.

On Thursday, the 26th of September, at 10 o'clock, A. M., the President will take the chair. The Fair will then be opened. The viewing committees will be called and vacancies filled. Lists will be prepared and delivered to the several chairmen. All reports must be made in writing, and signed by the committee or their chairman, and handed in to the Clerk of the Fair at the close of the first day.

Digitized by Google

The Society will assemble at the Court House in the evening, when subjects interesting to the farmer will be talked over and discussed.

On the second day of the Fair, 27th of September, the plowing match will take place at 10 o'clock, A. M., near the village.

At one o'clock the Society with its friends, will assemble at the Court House, when the Annual Address will be delivered, by a distinguished friend to agriculture.

After the Address the successful candidates will be called, two at a time, to receive their well merited rewards. To facilitate the distribution of the prizes, all the candidates will keep their seats, until called by the Treasurer.

All persons offering samples of butter or cheese, must be prepared to deposit with the President, a statement setting forth the number of cows, their breed, manner of keeping and feeding, management of the milk, mode of making the butter or cheese in detail, how preserved in winter and summer, and the time when made.

Persons offering samples of sugar, must be prepared to deposit with the President, a written description of the process or method of making the sugar.

Persons offering samples of honey, must be prepared to deposit with the President, a written description of the management and wintering of bees, and the process of taking the honey.

LIST OF THE COMMITTEES.

On Farms.—William F. Coan, chairman, Townsendville Post Office; Stephen Ludlum, Jacob L. Marshall.

On Grain, Flour, Grass Seed and Roots.—Thomas J. Folwell, chairman, Romulus, P. O.; Andrew Dunlap, Jr., Alexander Rorison.

On Cattle.—Sylvester Stringham, chairman, Waterloo P. O.; Wm. Martin, Alanson Woodworth.

On Fatted Cattle.—Cyrus J. Sutton, chairman, Ovid P. O.; Charles Sentell, J. J. Covert.

On Horses.—Lewis Post, chairman, Lodi P. O.; R. L. Stevenson, Jesse Abbott.

On Sheep and Swine.—J. Wykoff, chairman, Romulus P. O.; Wm. W. Sutton, Francis Yost.

On Poultry.—Hugh Chapman, chairman, Ovid P. O.; Joseph Keech, Joseph Marshall.

On Household Products.—Arad Joy, chairman, Ovid P. O.; E. I. Judd, L. F. Crowell.

Digitized by Google

On Wheeled Carriages.—Burr Bradley, chairman, Ovid P. O.; Lewis Woodruff, John Van Horn.

On Machinery and Mechanics.—Helim Sutton, chairman, Ovid P. O.; Abram Latourette, Jr., Clement Jones.

On Implements and Tools—John G. King, chairman, Romulus P. O.; C. D. Mynderse, Tallmadge Delafield.

On Fruits, Flowers, &c.—Rev. Edward Lord, chairman, Romulus P. O.; S. Pew, C. C. Coan.

Draining.—Jason Smith, chairman, Tyre P. O.; Samuel Gulick, H. T. E. Foster.

Discretionary.—Wm. R. Schuyler, chairman, Ovid P. O.; Alex. Rorison, 2d, D. D. Scott.

Plowing Match.—Andrew Dunlap, Sen., chairman, Ovid P. O.; James De Mott, Samuel Thomas, Cornelius Post, Joel W. Severn, Wm. Sweet.

Committee on Arrangements at Ovid.—James De Mott, Hugh Chapman, A. Dunlap, Jr.

Marshal, Col. A. D. Ayres.

Assistant Marshals, A. W. Barnum, Wm. F. Coan.

Clerk of the Fair, Hugh Montgomery.

The president stated to the meeting the action had by the State Agricultural Society in relation to a general survey of the county of Seneca, embracing its history, geology, geography, agriculture, past and present, that it would be entered upon without delay, and appealed to the Society and farmers generally for such information and aid as they could from time to time give. This was responded to by every vice president and member with a zealous expression of good will and offer of aid. The president also stated that Dr. Antisell, a distinguished chemist, long familiar with agricultural chemistry, would establish a laboratory at his (the president's) residence, and recommended that every farmer who wished to understand the constituent elements of his farm should send in samples for analysis.

During the meeting a gratifying incident occurred in the accidental arrival of Lewis G. Morris, Esq., vice-president of the State Society from Westchester. The remarks and observations of Mr. Morris gave additional interest and spirit to the meeting.

This meeting continued in session until a late hour discussing agricultural questions.

Eight years ago little was said or heard about county fairs or cattle shows. A few zealous men would assemble once a year to admire a few well bred cattle, and lament the falling off of the principal crops, or repine at the want of spirit and enterprise of the owners of the soil. How changed

Digitized by Google

is now the scene. Throughout the State thousands of farmers, their families and friends, look forward with joyful anticipation to the period when they shall be gathered from the uttermost parts of their county, to celebrate an annual fair, to exhibit in generous emulation the products of their skill and industry, to interchange opinions derived through the past year from observation and study, to exchange good wishes, kind feelings, and expressions of joy.

Such were the feelings which moved the people of Seneca county on the 26th and 27th of September, 1850. Early on the morning of each day the roads leading into Ovid from every direction were thronged as far as the eye could reach, with competitors for the premiums, their families with mirthful faces and stranger friends from distant places.

The show grounds had been well and commodiously arranged by the committee of arrangements, covering a field of eight acres, and gave ample space for the largest assemblage of cattle and horses, with other animals and objects of agricultural interest, ever collected in the county.

The numbers in attendance during the first day were estimated to be from five to six thousand persons, and nearly as many during the second day. The lesser number is equal to one-fifth of all the residents of the county, and from it may be augured an effect which, at an early day, will give to the farms of Seneca county a value, and demand for their possession, beyond what has hitherto been known, because the income from farming will then be found generally, as it is now in many individual cases to be as large as can be derived from any other occupation, without risk or anxiety.

The first day of the fair was devoted to the examination of the various objects presented in competition for premiums. In the evening a meeting was held in the court house, which could not contain the whole number of persons who sought entrance. A new feature in the society's proceedings seemed to have excited a lively interest, and added a charm to the doings of the evening.

During the early spring a proposition was made to the society, and approved by the officers, to encourage by sufficient premiums or otherwise, a more perfect and general study of the works of nature, with a view to elevate the mind, and bring it in more frequent communion with its Creator. It was urged that the pursuit of knowledge connected with the vegetable kingdom presents one of the means whereby we are enabled to compel all living things to minister to our daily comforts, pleasures and necessities, and it was proposed to make the first movement by a *voluntary* subscription of twenty-five dollars, to be distributed to those who at the next fair would offer the greatest variety of flowers, trusting by this means first to

Digitized by Google

interest the wives and daughters of the county. The premiums offered in this department were,

1st. Loudon's Flower Garden of Ornamental Annuals, ... $12 00
2d. Lindley's Vegetable Kingdom, ... 8 00
3d. Loudon's Gardening for Ladies, ... 2 00

It was further proposed that every gentleman who would contribute to this fund should be privileged to compete for premiums by producing essays upon the following subjects, viz:

1. The influences of rural life and its pursuits upon the human mind.

2. The relation of vegetation to seasons or the periods of growth, and the periods of rest.

3. On the colors and odors of flowers.

The premiums to consist of bouquets selected from offerings of the ladies, and according to their corresponding scale of merits—the names of the successful candidates only to be called for or made known. This effort proved successful. The rooms were well supplied with choice flowers and plants.

The committee on flowers reported by their chairman, (Rev. Mr. Lord,) that "The gifts laid upon Flora's altar were rich and splendid, surpassed in beauty only by the fair competitors." The floral ornaments and bouquets contained from fifty to one hundred varieties of flowers many of them being from rare and curious plants. We congratulate the society on the success that attends this new and interesting feature of their annual festival. The love of the beautiful is cultivated, and the floral ornaments are a relief to the eye after viewing huge piles of products and various articles whose beauty is comprised alone in their utility.

Moulded under the influences which the cultivation of flowers afford, acquainted as they must be with the morning air, and constantly surrounded with beauty and the emblems of innocence and peace, our daughters will grow up as polished gems.

We hail the exhibition in this department, as evidence of the approach of the physical millennium. The world is to be brought under that state of cultivation, that it will be like a beauteous garden. The time is approaching when, we are told, the trees of the field shall clap their hands, and instead of the thorn shall come up the fir tree, and instead of the briar shall come up the myrtle tree. In the fulfilment of this declaration woman will perform her part; under the windows of every cottage, flowers will yield their fragrance as they nod to the gentle wind, vines will creep over the lattice and the arbor, and everywhere fruits and flowers and waving fields will betoken a change in both the natural and the moral world.

The president, on taking the chair, opened the evening's proceedings with

Digitized by Google

a few prefatory remarks upon the objects of beauty which ornamented the stage and tables: their probable influence in years to come, upon the moral as well as on the agricultural condition of the county. He pointed to an influence already exhibited in the collection of grasses by an intelligent and estimable young lady; not only the grasses which farmers ought to cultivate, but weeds also which farmers ought carefully to eradicate. These objects brought thus to the eye, bring with them knowledge most useful, and to many entirely unknown.

The committee on essays reported by their chairman, (Hon. A. Bolter,) that two essays had been submitted to them, under the volunteer premium list; that believing this new feature to be capable of much benefit to the county, they regretted sufficient time had not been afforded to the committee to give the subject due consideration, and the essays such examination as the society had a right to expect. With other and agreeable remarks from Mr. Bolter, the essays were presented.

The first essay, on the influences of rural life, was then read by the author, Mr. William Wickoff, of Lodi, and was entitled to the first premium. Mr. Wickoff read as follows:

THE INFLUENCES OF RURAL LIFE AND PURSUITS UPON THE HUMAN MIND

That the human mind is swayed almost entirely by influences, whether good or evil, is a truth too well known to be denied. Whatever may be the reason of this phenomenon of our mental natures, the fact presents itself to view in many varied forms.

The experience of our own lives gives us abundant evidence of mysterious influences that have given shape to pathways thus far. Yesterday our course lay toward a given point, to-day where is it, and to-morrow where will it be?

But among the many influences that operate upon the human mind, those of Nature may be regarded among the best and purest. Man is so constituted that intercourse with Nature is essential to his happiness and well-being. Into his hands are committed the culture of her soil, to his intellect the investigation of her laws, that in the end not only his physical condition may be improved, but his finer feelings ennobled—his heart made better.

Nature may speak in her wildest notes, in her softest and silvery tones—in the storm, or the bow of promise; yet her voice is no less sweet or majestic, when she speaks from her fields of golden grain waving in the sunbeams—from her meadows and blooming orchards—from the flowers and shrubs that adorn the rural cottage.

Aside from the pleasing impressions conveyed, Nature is man's best teacher.

Digitized by Google

"She unfolds her treasures to his search, unseals his eye, illumes his mind, and purifies his heart. Her influence breathes in all the sights and sounds of her existence; she is Wisdom's self. She yields rest to the many of the earth,—its "heavy laden:" she endows with strength when sorrow presses on us, when the stings of bitter disappointment pierce our soul, when our eye becomes weary at the sight of man, and our ear turns distrustful from his jarring voice, the shadowy forest and quiet field are then our comforters; a sweet breath from heaven fans our fevered brow, the blessed sunshine yields a sweet delight, the birds low warble thrills within our breast, the flower is eloquent with peace and joy, and better thoughts come over us.

A lighter heart and purer feelings cheer our homeward way, we prize more deep the blessings that are ours, and of rest, a higher and holier trust in God. And when the summer moon-light bathes night's purple sky in rich transparent splendor, brightening all below, as though at God's command; earth's angel-guard had dropped his silver mantle from his form upon her, to protect her helpless sleep, Nature speaks soothing music, stealing through each avenue of the heart, till all is peace. The stone is rolled from Pleasure's sepulchre, and forth she treads again in life and light; our thoughts are lifted, passions swept away, and in our soul a holiness is shed, a mental moonlight, pure and sweet; the feverish throbbing leaves our brow, and sleep glides over our senses like a pleasant shade.

Nature teaches us philosophy, in the quick shading of her brilliant morn, by the dark storm-cloud; in the canker-spot that lurks within her blushing fragrant rose, in the sad blighting of her summer leaves, when autumn wields his tempests; solemnly she warns how full of direst change is life, how perishing our sweetest, brightest joys, how often death lays our dearest feelings waste and makes existence cold and desolate.

But oh! she teaches, also, blessed Hope,—Hope, the sustainer!—Hope, which keeps the heart from breaking in its sorrow. Glorious Hope! in the light seed that cradles the green plant, in the bright sun succeeding the dark night, in the blue-eyed spring that plants her violets within departing winter's melting snows. And, holier theme, she teaches us of God, her Architect, her Master. At His feet she crouches, and in offering Him her praise from myriad altars, and in myriad tones, she bids man praise Him also.

And this is rural influence on the life of man; such may be the current of his thoughts when the toils of the day are over; when surrounded by those he loves, he remembers the past, enjoys the present, and confides in the future.

Digitized by Google

The second essay was then called for. The author did not answer at the moment, and by request the President read the essay on the "Relation of Vegetation to Seasons," as follows:

"RELATION OF VEGETATION TO SEASONS."

To the President and members of the Seneca County Agricultural Society:

GENTLEMEN—You have permitted a new feature to exist in the system of your association, designed to encourage the inhabitants of the county in the study and examination of the many works of the Creator, which from year to year gladden the eye, while too often they fail to touch the heart. Works which the beneficent Creator, not only ordained should be *good* and contribute to the happiness of mankind; but who made every thing "*beautiful in its season*," and so formed our minds, that we all are capable of deriving pleasure, instruction and permanent benefit from the least as well as from the greatest of all his works. He has affectionately placed before us the volume of the creation whose pages are day by day unfolded, (unrolled to our view,) written in "the only language which has gone forth to the end of the world, unaffected by the confusion of Babel." This volume, however, is not to be read without study; its design, its beauties, its absorbing interests, cannot be comprehended and embraced without careful attention and investigation.

To you gentlemen of the society it belongs; to you, is the credit due, for presenting to a portion of the young a department of this great work, for their amusement and research; and making them the means, under the guidance of higher influences, for acquiring and disseminating a knowledge of the power, wisdom and goodness which governs the universe or bids the gentle violet to raise its timid floret.

The study of plants, has not received in any part of the world, the attention which its importance demands. This importance can need no other argument for its support, than the well established fact, that all animals are dependent upon the vegetable creation for their sustenance. The pleasures of this study are known comparatively to few; always within reach, ever in our path, the very facility for their examination encourages the error of procrastination or the worse evil indifference.

Wherever the rocks have crumbled into soil, or wherever the overflowings of the mighty waters have deposited the drifting clays and sands of other parts, there plants spring up, mature and decay. The small island in the mid ocean, or the rich soil of our richest State, or even the cinders of extinct volcanoes offer place and food for the display of vegetable beauties.

The crevice of the rock around the falls of Lodi, or the hanging slopes

Digitized by Google

of the deep glens of the Cayuga banks, afford resting places for seeds floating in the air, and soon spreading from point to point of jutting rocks, cover the surface with vivid green or flowers of varied hues.

Having completed their task, they wither, drop their leaves and *seem* to die; but no extreme of winter's frost or summer's heat destroys the vital power; for when the warmth and light of spring returns, after the blasts of winter, a succession of leaves and flowers again break forth to droop, wither, and pass away. Thus exhibiting the seasons *of growth and rest*, as named in the prospectus of the society for consideration.

So enticing, so beautiful and full of interest is the subject, that the limits of an essay to be read on the occasion of a joyous public festival like our Annual Fair, will not permit the recital of facts, the exemplification by specimens, or the extended remarks which seem due to the subject or to the Society. Allusion therefore, will be made to some features of interest, in the ardent hope that a better essayist may pursue the subject more extensively at some future meeting.

An opinion has been entertained by many that the *period of rest*, as it appears in our forests, when the tall tree bends to the fury of the winter blast, is perfect and complete; this is however, an error for it is found that the sap flows though in an exceedingly retarded motion.

It is evident to the reflecting mind, that every plant, whether tree shrub or flower has its appointed period for germination, for putting forth the leaf, blossoming and rest; or as in many instances, a total decay after the production of its seed. We see the oak, elm and maple unfolding their foliage year after year, while the essentially useful Indian corn, our wheat and oats live but a season then wither away and decay.

This proves the existence of certain laws by which the growth and rest, or the death of plants are regulated. And here it may be useful to remark one of the laws in relation to the continuation of the same kind of plants, viz: the seeds of plants are in every *essential* particular *similar to the parent seeds*, so that through generation after generation, every plant and tree of this day is a direct descendant of the same kind existing, when vegetation first covered the earth. If an exception seems to exist, it is the work of art only, and such exception will ever have a tendency to fall back to the character and appearance of the original plant. For instance the seed of the *improved* apple of this era, when planted, will rarely produce trees yielding a similar fruit as the parent. They are generally inferior, and tending to the character of the earliest known fruit of the apple kind.

One other illustration may aid in finding a remedy for a present serious evil in this State. The *potato* in its native climate does not require a large

Digitized by Google

store of nourishment; the plant shoots up and finds moisture and warmth *constantly* supplied by the atmosphere, and in abundance sufficient to develope the full plant. The large fleshy tuber is *not* necessary to contain these essential requisites; consequently the tuber is *small* and unimportant. When brought however to our colder climate, and stimulated by cultivation, the tuber is greatly increased in size, and furnishes that moisture which our usually dry summers will not afford to the vines and leaves of this foreign root. There is therefore a constant tendency in the plant to restore itself to its original character, which nothing but art prevents.

It has been asserted that the *rest* of plants is not perfect, is not complete, and this seems clear from the following fact, that if we remove our hardiest trees to a warmer climate, where sun, air and moisture give a luxuriant growth, and no frosts ever nip the bud or sear the leaf, yet at the allotted and usual period the leaf will droop, will wither and decay. The invigorating stimulus of the climate induces the unfolding of new leaves and this second crop will fall after passing through a like period of existence. Here then we see a continued vital action, uninterrupted, though at periods retarded. This continued vital action, this absence of entire repose, is more strongly illustrated in the various evergreens seen in different parts of the county. These plants do not retain their leaves longer than a year or less, but they remain until the new leaf shoots forth, and gradually though slowly displaces the old, and thus by incessant action and without rest, the tree or plant maintains its colored dress.

Again, there are some trees in warmer climates which drop their leaves several times in the year, but they are immediately replaced by new, and in this country it is a common occurrence to see the pear tree putting forth a second crop of leaves in the autumn, and sometimes blossoms.

These efforts however exhaust the plant, as excessive labor exhausts the human frame. The result of stimulated vital action is alike in either case, premature old age, withering and death.

The manufacturer of maple sugar knows full well the active vitality of the maple tree, which in frost and sunshine pours forth its rich juices. And the woodman's axe, when wielded in the depths of winter, is stained by the heart's drops of the tree, ere it falls prostrate at his feet. Absolute rest then, is as unknown to our plants as it is to our restless bodies. We sleep, and it may be our circulation is less strong, yet it flows on in unceasing action; just so with plants, their circulation becomes languid as the temperature falls, the fine vessels which supplied the leaf with sap become choked with the thickened juices, the veins of each leaf are dried, vitality is so far denied, that the leaf withers, dries, and like all dead matter is thrown off

Digitized by Google

from the living body; thus we may account for the fall of the leaf, and we have shown that vital action is continued unceasingly in the body of the plant. But it may be said that such plants as the hyacinth, the tulip, and the onion, may live for seasons unaltered, and after years of a torpid condition, again shoot forth and bloom. This is true, but it must be remembered that in all such cases, the root has been deprived of moisture, air or light, for whenever these are applied, these roots *cannot be prevented* from growing, and the fact only proves the extreme tenacity of vitality, a power well known as peculiar to many seeds; and as an instance it may be usefully stated here, that a few years ago a mound was opened in England, and at a distance of thirty feet below its summit was found an embalmed body of a human being. Curiosity led to its examination, when coins of the date of the emperor Hadrian, were found in the winding sheet. This established the probable date of sepulture, as being about one thousand six hundred years ago. In the stomach was found a few seeds, and these were deposited with the horticultural society; they were planted in the society's gardens, they sprang into life, and proved to be *raspberry plants.*" As these facts are related by Dr. Lindley, as an eye witness of the plants, we are not at liberty to doubt them; neither shall we feel disposed to doubt the general position, when we remember the continuance of weeds and seeds against which our fathers and ourselves have waged warefare for ages unsuccessfully. Having denied the position of *a period of rest*, it remains to show the relation of growth to seasons.

One of the laws of vegetable life, or I may say a *condition* of vegetable life, is the presence of *heat*, and this law alone might carry to the mind a conviction of close relationship between growth and seasons. Few seeds will *germinate* when the mean temperature is below 40° to 45° of the thermometer; heat, therefore, is as necessary to start a seed into life as it is to hatch the egg of a bird.

One other condition of germination is *moisture*, to dissolve the elements of food for the young plant, without which it cannot spring forth. These two conditions are familiar to all, and all know that seed sown in the spring when the heat of the sun has warmed the ground to 40° or 45°, germinates speedily and healthily, while seed sown in the autumn germinates, it is true, but as the cold increases it remains nearly without change until the warmth of spring returns to give greater activity to the circulating juices.

Moisture is supplied to plants chiefly by their *roots*, which is evaporated from its leaves, and this evaporation or exhalation is in proportion to the greater or lesser amount of light; it is greater during sunshine and less at night; it is greater during hot weather, it is less in a lower temperature,

Digitized by Google

The moisture which thus enters by the roots and pervades the plant, carries with it the food necessary for its growth and development; while the moisture is in due proportion, and the heat sufficient to act upon the branches twigs and leaves, the plant flourishes, the season is propitious, and man enjoys the fruit. Any interference with heat and moisture must disturb the natural functions of plants. The seasons, obedient to the Creator's will, follow their annual rounds; the plants and fruits of the earth advance and retire as heat and moisture animate them, or as cold and frost retard their action.

Thus dependent on the seasons, it is for man to gather the seed, and by patient toil and study, learn to exercise that control which is vouchsafed to his reason, whereby he may increase his store, shed joy and happiness around him; and when at last the period of his duration is complete, and the ends of his existence are accomplished, his frame no longer able to sustain the weight of years, it is for man to praise, with grateful heart, the all wise Being, who smooths the path of the vale of life, and to join in the chorus which proclaims his "might, majesty and dominion." Then, at the closing moments of sensation, to pass gently and tranquilly into that sleep from which he may awake in the realms of eternal bliss.

M. N.

Another call was made for the author, when it was intimated that he prefered to remain unknown; having contributed in a small degree to promote the objects of the society, his whole aim was accomplished, provided he had said nothing objectionable.

The matter being before the society for consideration and action, upon motion duly seconded, the essays from Mr. Wickoff and from M. N., were accepted with thanks to the respective authors, and ordered to be printed and published with the proceedings of the society.

Agricultural subjects were then discussed, various gentlemen were called up by the interest of the questions brought forward, and gave their views, observations and opinions. At a late hour the society adjourned, to meet at the plowing ground on the following morning.

The morning of the second day was dark and rainy; at the appointed hour the ground selected to test the skill of the plowmen was well attended. Thirteen plows started for the several prizes: though the rain fell fast, the people in numbers held the ground, and by their presence cheered the workmen. Several boys had entered the lists, and by their perseverance, good management of their teams and excellence of work, obtained much applause. Among the older competitors, were to be seen some of the veteran farmers of the county, who rightfully exult in their power over this implement.

The Michigan sub-soil plow attracted much notice and commendation.

Digitized by Google

Notice had been given that at two o'clock the annual address would be given by Prof. Norton, of Yale College, at the court room. Long before the hour appointed, the room was occupied and every avenue filled. The rain having ceased, a proposal was made and readily acceded to, that the meeting should adjourn to the public square; the ladies to occupy the vestibule of the court house, while the gentlemen occupied the square in front.

A stage was erected and every convenience prepared which so short a notice permitted. The choir was placed directly in the rear of the professor's chair, and opened the proceedings of the meeting with an appropriate air. The president made a short address to the assembled farmers, introducing to them, Prof. Norton, who addressed the meeting in the following words:

Mr. President, and Gentlemen of the Seneca County Agricultural Society:

To a county agricultural society in this part of the State of New-York, it seems scarcely necessary to make an apology for an address upon the subject of scientific agriculture. You are here familiar with the name at least, and have learned to know that some really excellent practical farmers are men who ascribe much of their success to books and to the teachings of those who have studied farming in the laboratory and the library, rather than in the field. In some regions that it is not necessary to name, I have felt in rising to talk to an assemblage of farmers, that the first thing was to satisfy them that I had a right to be there at all, that I was not some impertinent pretender come to betray them into newly devised and absurd changes, from a mere love of novelty and notoriety. In such assemblies I have felt myself well satisfied if I could convince one or two of my judges that there was something in this new doctrine, and leaving the remainder to conclude that my remarks were on the whole well intended, even if I was rather presuming in the attempt to impart knowledge to old hard working farmers.

Here the case is far different. I feel that a large number among this audience are ready to receive and to profit by every valuable innovation on the old ways; that many among you believe in the maxim that "a man is never too old to learn," and that my remarks will therefore, by a large portion of my hearers at least, be received with a candid spirit of enlightened inquiry, and not with the stubbornness of preconceived prejudice.

The vast extent of the field covered by scientific agriculture is unknown to those who have never studied the subject thoroughly; neither is the extent of ignorance which has prevailed through a large portion of the farming community at all appreciated. These positions may be made clear by selecting almost any point in practice, and studying it thoroughly with the

Digitized by Google

help of men and books. How much there is to learn, and how little has been known, are facts which become clear at about the same period of time. I propose to illustrate both of these propositions to-day, by calling your attention to a single subject. I will select one that will possess the attraction of local interest.

This is a wheat county, and it is of much importance that the yield of that crop be increased, in place of continuing to decrease, as it has certainly done on many farms. I think that some light may be thrown on the cause of this decrease, and on the nature of the crop, by a brief account of the wheat plant in regard to the structure of its several parts, and their chemical composition, finally bringing the information thus collected to a practical bearing upon various questions connected with its cultivation. It will be seen that there is a very great number of points to which attention may profitably be directed. These will, in the present case, be impressed by the great value of this crop to our country generally. I will first devote a few words to the structure of the plant, and of its various parts.

That part to which our attention is first naturally directed is the seed. Viewed externally, this is merely a small brownish, or whitish oblong mass, presenting a white interior when broken. If kept perfectly dry it will remain unchanged for a thousand years, but when exposed to moisture and warmth, a change speedily occurs. The seed swells and soon opens its outer covering to permit the root and stem to shoot forth. This is all very simple in description, but it is only after years of study that we have arrived at an even imperfect knowledge of what really takes place at this time. I do not purpose to go at length into a scientific account of germination, but will mention in few words the changes that occur. The seed in its natural state contains a dry, white substance, which is for the greater part insoluble in water; this is mostly starch. Now the young shoot, until it reaches above the surface of the earth, and until its leaves begin to expand, must draw its nourishment from the seed, but since the principal part of the seed is insoluble, how is this done? It is found that at the time of germination, a substance called diastase, is formed, which has the power of rapidly converting the starch into a species of sugar, or a species of gum. Both of these are soluble in water, and consequently go immediately to nourish the young plant. Now this change will not take place properly, save under certain conditions. The soil must be moist, and not very cold, and the seed must be buried at such a depth as to be accessible to air. If there is no communication with the air, the seed will not germinate, even though the earth be warm and moist. Without air, the change by means of diastase, of the starch into sugar or gum, will not occur. This fact is often illus-

Digitized by Google

trated when we bring up earth from a distance beneath the surface, if thrown upon one side in the middle of a grass or grain field for instance, it will soon be seen covered with plants, and these in many cases entirely different from any growing in the immediate neighborhood. There seems no way in which we can explain many curious occurrences of this kind, except upon the supposition that these seeds may have lain in the ground buried deep, and consequently only grew when brought near the surface; warmth, air and moisture are thus seen to be necessary adjuncts to successful germination; but if we bring the seed immediately upon the surface, even under these conditions, it will not grow, thus showing a fourth requisite, the absence of light. Unless the position of the seed is such as to ensure all four of these conditions, it will not produce a healthy plant, and usually will not grow at all. This explains to us why so small a portion of the seed sown ever comes to anything.

It has been shown by some authors from actual counting of the seeds in a bushel of wheat, and by comparison with the yield obtained when a given quantity is sown, that when the greatest crops known are obtained, little more than half of the seed sown vegetates. In the case of ordinary crops, the produce is not more than ought to be afforded by about one-third of the seed sown; the remaining two-thirds are lost, some buried too deep, some not covered at all, some destroyed by insects. One great advantage of the drill machine for sowing is, that the seeds are all deposited at an equal depth, and at equal distances apart; the growth is consequently regular, and the plants are much less liable to be luxuriant, in some spots, and scanty in others. Covering with the cultivator, or gang plow, produces something of the same effect. A considerably reduced quantity of seed will thus answer the same purpose, as none of it is lost. The saving of half a bushel or a bushel of wheat per acre becomes of immense importance when we consider the number of acres sown in any one year.

When the young shoot has reached the surface of the ground, and has begun to expand its leaves, it is no longer dependent for food on the parent seed. Its roots have by this time begun to collect food from the earth, and there is a constant flow of sap upward through them. In good soils these roots will go down for several feet, and of course in penetrating so great a distance are much more able to draw abundant supplies for the plant, this shows the importance of artificially deepening the soil, when the subsoil is not naturally mellow, and of draining when this portion is constantly filled with water. In either of these cases, the plant might almost as well endeavor to extract food from a pavement, as from the subsoil, until it is improved. But if the plant finds a soil of proper depth, and well supplied

Digitized by Google

with its requisite food, its growth is rapid, and opening its leaves it begins to receive food through the pores, with which a microscope shews their surface to be covered. These during the day draw in certain kinds of air, which in the interior of the plant, are converted into solid portions of its substance. That this is the fact, has been proved by numerous experiments. The part of the plant which thus comes from the air, is of course a clear gain to the farmer, as it does not exhaust his soil at all; and here is an advantage which the good cultivator obtains over the poor one; his plants find a rich soil well prepared for the supply of their wants, and shooting vigorously up, are able to spread out broad luxuriant leaves in the atmosphere, drawing in far more food from this source than the small yellow leaves of a poor crop could possibly absorb. The very air then, is more bountiful to the man who treats his soil liberally.

With all the appearances visible in the external growth of the wheat, every one is familiar. There are many points that have been ascertained, relative to the internal changes which occur in the stalk at different periods, and also during the formation of the grain, which time will not permit me to notice now. While the grain is ripening, the materials for its composition gradually leave the stalk, and that part looses by degrees its nourishing properties, until finally, nearly all of the nutriment is concentrated in the grain.

It now becomes necessary, that we should enquire particularly into the composition of the grain. If in the first place we burn it, we shall find that nearly all of it disappears, so that from one hundred pounds of wheat there will not remain more than about two pounds of ash. This ash has evidently all come from the soil; the other portion which has burned away was originally air, drawn in mostly from the leaves, in the manner that I have before mentioned, but also in part through the roots. This combustible portion being by far the largest part of the whole weight, we will attend to it first. By means of various chemical processes, the substances composing this part of the grain may be separated from each other, and with a tolerable degree of accuracy.

The following analysis is an instance of the proportions in which they are found to exist in wheat:

Digitized by Google

TABLE I.

Composition of the Grain and Straw of Wheat.

Organic part of grain.		Ash.	Grain.	Straw.
Starch, ...	62·29	Potash,.....	28·72	12·44
Gluten, ...	13·00	Soda, ...	9·05	0.16
Gum,.....	1·21	Lime,.....	2.81	6·70
Oil, ...	1.02	Magnesia,.....	12·03	3·82
Sugar, &c.,..	6.40	Oxide of iron, ...	0·67	1.30
Epidermis, ..	7·20	Phosphoric acid,...	49·31	3·07
Water, ...	9·79	Sulphuric acid, ...	0·24	5.82
		Chlorine,.....	——	1.09
	100.91	Silica, ...	1·27	65·38
			99·50	99.78

The first analysis is from Dr. Emmons' Agricultural Report, and agrees pretty well with most of the examinations made by other chemists. Starch, it will be perceived, is the leading substance, and next to this is Gluten. The latter is the only body in the grain that contains nitrogen, and is consequently the source of muscle in animals that live on wheat. Take away this constituent of the grain, and feed an animal exclusively upon what is left, and it cannot thrive, cannot increase or even maintain the bulk of its muscle in its body; its strength will gradually decrease. Whenever we find any food which contains according to chemical examinations, much of substances like this gluten, it may be asserted without fear, that such food is eminently nutritious.

The other substances, the starch, impure sugar, gum, and oil, are of use in forming the fat of the animal, and also in keeping up respiration. This is one of the most curious and important facts discovered by modern chemists and physiologists. At every respiration, a portion of the starch, gum, &c., of the food is consumed in the lungs, and in the blood vessels of the extremities, for the purpose of keeping up the animal heat.

Every one is familiar with the fact, that if he labors hard, especially in cold weather, he requires more food than with the same amount of exertion in warm weather, and that if he is hungry at such a time, and deprived of food, he soon begins to suffer from cold; this is because he needs a fresh supply of material to burn in the lung for the purpose of keeping up his vital warmth. Every farmer knows or ought to know, that if his animals in winter are kept warm, and sheltered, they do better than those that are exposed in the open air to the cold. This is because in the latter case, a

Digitized by Google

large part of the food which would otherwise have gone toward fattening the animal, is used up in the increased respiration necessary to keep him warm.

It is worthy of notice, that in this grain, which is taken in fair marketatable condition, there is according to the table, about ten pounds of water in each one hundred of grain. New wheat frequently contains from twelve to sixteen pounds in one hundred.

I may here say a few words, as to the various practices which are followed in cutting wheat. If allowed to become dead ripe in the field, a considerable portion of its starch and sugar is changed to epidermis, or woody fibre, that is the skin. The grain will then yield more bran, and less fine flour, than it would have done if cut ten days or a fortnight earlier. The result of many careful experiments has shown that when cut at about the above time before entire ripeness, the grain is heavier, more plump, and actually measures a greater bulk. The skin is thinner than it would have been if allowed to stand, for the causes mentioned above, and therefore more fine flour is obtained to the bushel.

The same reasoning applies to the straw. It is well known that if wheat be mown and fed to stock while green, even with heads cut off, it is an excellent fodder; and it is equally well known that if allowed to stand in the field till the grain is ripe, the straw consists of little but dry indigestible woody fibre. Now the same change takes place, to a certain extent, in the straw, as in the grain; it also contains some gum, sugar, &c., and is therefore nutritious while green, but as it ripens, nearly all of these are converted into woody fibre, in the manner that has been mentioned.

By cutting the grain then, before it is quite ripe, a double object is gained; its own quality is improved, and the straw when cut up with hay, &c. is readily eaten by stock, and has really some nutritive properties.

I will now call your attention to the columns representing the composition of the ash in one hundred pounds.

The most important point, and that which I particularly ask you to remember, is the large quantity of phosphoric acid, in the ash of the grain. The above analysis is the average of six or eight, by eminent chemists, and is given by Johnston in his lectures. Phosphoric acid, it will be seen, constitutes about half of the whole ash. If we look at the ash of the straw, we see that it contains but three pounds in one hundred. The cause of this difference becomes beautifully apparent, when we consider that the grain is the part more especially designed for food. This same substance, phosphoric acid, constitutes the leading body in, and gives their peculiar properties to, the bones of animals; hence the necessity that it should be concentra-

Digitized by Google

ted in the grain, which is the part peculiarly intended for food, along with the gluten which is to clothe those bones with muscle.

I do not attempt to explain here, the precise nature of the substances to which I refer, as it would prevent my presenting an entire view of this subject, without wearying my audience. Those who do not know what they are I must ask to believe that they do exist, and to take my word for their properties and effects, until they can obtain access to some book or some other means of studying them out for themselves.

Other important substances in the ash of the grain, are potash and soda; they amount commonly to about one-third of its whole weight, and are valuable, as also necessary for the animal, being always found largely in the flesh and blood; thus we see that the grain in all its constitution, seems to have been especially adapted to serve as an appropriate food for the animal; each little seed contains within itself, its proportion of material for the formation of the bones, the muscle, the blood, the fat, of the body, and also for maintaining its warmth.

In examining the constitution of the ash from the straw, we find that the leading substance there is called silica; this is that which constitutes the common flint, common granite, crystals, agates, &c. Although so hard and insoluble in acids, yet plants have the power of dissolving it, and are thus able to make use of it for their own purposes. Silica gives the hardness, and the glaze, to the outer part of the straw, and is supposed to be principally of use in strengthening it, and enabling it to uphold its load of grain.

When a particular piece of land fails for years in succession, to produce a straw that will stand, it is generally found on examining the ash of this straw, that there is a deficiency of silica. The column referred to presents an average of six or eight analyses, and the proportion of silica given by it, is about two-thirds of the whole ash. Sulphuric acid, (oil of vitriol,) is usually present in considerable quantity in the straw ash, while there is little in the grain ash. Potash and soda, are greatly reduced in quantity. There is a curious fact here indicated, relative to the lime and magnesia. In the grain, magnesia, and in the straw, lime is most abundant; this is almost invariably the case, but we have as yet no clue to the reason.

It is at once perceptible, from a glance at the above columns, that each of these parts has a composition of its own as to its ash, and that the differences are of a very important nature. This point will be referred to again.

I have said that one hundred pounds of grain yield but about two pounds of ash, oftener less than more. If we burn one hundred pounds of straw, the ash will weigh from six to ten pounds, sometimes even as high as sixteen. There is thus a great difference in the quantity as well as the quali-

Digitized by Google

ty of ash in these two parts; the straw from an acre will of course contain far more ash than the grain.

Having now hastily sketched the nature and composition of the stalk and grain, so far as necessary for our purpose, we come next to consider what influence we can exert upon the composition of these parts; can we by any means establish certain rules, whereby we may be able to influence their quality and quantity, with any degree of certainty? It is well known that much land which formerly bore good wheat, will do so no longer, when manured in the common way, as just shown. Can we discover any clue to this difficulty by means of the chemical composition of the plant?

In order to answer this question satisfactorily, we must resort to analysis of soils, with the view of ascertaining, if possible, how direct and important a connection exists between the soil and the plant. The answer can, I think, be given in a most decisive manner. For this purpose, I would call attention to the following table:

TABLE II.

Table to illustrate the composition of wheat soils.

	No. 1.	No. 2.	No. 3.	No. 4.
Silica,	74.39	63.19	73.52	73.27
Peroxide of iron,	4.72	4.87	4.32	8.15
Alumina,	5.54	14.04	7.36	5.41
Lime,	1.39	0.83	2.71	1.72
Magnesia,	0.75	1.02	1.63	0.62
Potash,	1.71	2.80	0.55	0.13
Soda,	0.68	1.44	0.36	0.12
Sulphuric acid,	0.10	0.09	0.05	——
Phosphoric acid,	0.15	0.24	0.22	trace.
Chlorine,	0.01	0.01	0.06	trace.
Organic matter,	6.33	8.55	6.67	8.00
Water,	4.43	2.70	2.50	2.39
	100.30	99.78	99.95	99.81

The first three soils in this table, are specimens of some of the best Scotch wheat soils, from the Lothians, the Carse of Gowrie, and Perthshire. These were taken from among a number of analyses lately published by Dr. Anderson, the able chemist of the Highland Society of Scotland. He has examined certain well known soils from various parts of Scotland, long famed for their capacity of bearing wheat. The results obtained by him are most interesting and instructive. Did time permit, it would gratify me to give

Digitized by Google

these excellent analyses in more detail, but the present form will suffice to establish some of the points which I desire to impress.

These soils have, from time immemorial, been sown with wheat at least once in four years, and sometimes oftener, yet their present fair average product is from thirty to forty bushels per acre. The soil No. 2, had been cultivated in a seven years' rotation, during the course of which wheat came in three times. For the rotation previous to this examination, the yield had been one hundred and eight bushels per acre, or thirty-six bushels at each crop; the first in the rotation being forty-four bushels and the succeeding ones thirty-two each. This evidence may, I think, be sufficient to warrant us in sustaining Dr. Anderson, when he calls them fine wheat soils.

Let us now compare them for a few moments, with Table I. The ash of grain contains, as will be perceived on comparison, the same class of substances which exist in these first three soils, although in different proportions. Phosphoric acid, which constitutes one half of the ash, forms a very small part of the soil. It might be thought, therefore, that so small an item in the soil, could not afford all that the grain required; but if we consider the number of hundred pounds in each acre, we shall arrive at a very different conclusion. It is estimated that the weight of soil over an acre, taking it at ten inches deep, varies little from one thousand tons. In soil No. 2, there is about one-fourth pound of phosphoric acid in every one hundred pounds of soil; this would give five pounds in each ton, and consequently two and a half tons to the acre, a very great quantity. One hundred pounds of wheat, it will be remembered, contain about two pounds of ash; forty bushels of wheat on the acre, weighing sixty pounds per bushel, would be two thousand four hundred pounds, and this would contain 120 pounds of ash; one half or sixty pounds of this, would be phosphoric acid. Supposing the grain to be sold off, and the straw only or its equivalent returned as manure, it would take between eighty and ninety years of unintermitted cropping, to exhaust this soil.

Even of chlorine, which is but one-half of a pound in every hundred, or only one pound in a ton, there would therefore be one thousand pounds or half a ton in an acre, a quantity sufficient to last at least half a century, so far as direct exhaustion by cropping is in question.

Of potash and soda, there are in the second soil about three and a quarter pounds in one hundred, or sixty-five pounds in one ton, amounting to thirty-two and a half tons per acre; a stock sufficient to last a century, even under the most unskilful cropping.

The quantity of organic or vegetable matter in these soils, is also worthy of attention. In No. 2, it is eight and a half pounds in one hundred, or

Digitized by Google

one hundred and seventy pounds in one ton, which would be eighty-five tons to the acre. This is not so large a proportion as many might have expected; not more than would be added by five or six heavy dressings of manure from the barn yard. Some of these fine soils, it will be observed, contain but about sixty tons of vegetable matter, and cases might be brought forward of very excellent soils, containing not more than twenty or thirty tons to the acre.

From these statements it is clear that the above figures, which seem so small, really represent considerable quantities in an acre of soil; and when compared farther with the weights of the various kinds of substances composing the ash of wheat, are truly ample supplies, such as well entitle these soils to be called rich.

It must not be thought that all soils capable of bearing good wheat have a composition necessarily identical with either of the above. The substances may all be in entirely different proportions, and yet the soil be equally good. Some of the best wheat lands known are in the limestone regions, where the soil often contains many times more lime than is here shown. The exact proportion then, in which they are present, is a matter of little consequence, provided that they are there, and in sufficient quantity to last for some years. Thus we establish a rule, that in a good wheat soil, no matter where we find it, the substances named in table two will all be found, though not in definite quantities. This we assert at present, upon the simple comparison between the first three soils in table two, and the composition of ash given in table one. I shall proceed to sustain this position by other proofs, but will previously notice some experiments made by Dr. Anderson, upon the organic part of these soils. It will be recollected that the organic is by far the largest part of the grain. It has been found that plants can easily make the requisite quantity of starch, sugar, gum, woody fibre, &c., upon almost any soil; but unless there is also a supply of nitrogen in some form, they cannot make the gluten, and bodies of that class, which were spoken of as necessary to form the animal muscle.

The above three soils were therefore analyzed in their organic part, to determine the amount of nitrogen that this contained. It was found that the per centage varied, but that in all of these good soils there was a very considerable amount. In the particularly rich sample, No. 2, there was nearly 0.25, or one-quarter of a per cent., that is according to the calculation in the case of phosphoric acid, about 2½ tons per acre. It is evident from the small proportion of nitrogenous substance in the grain, that here too is enough to supply a long succession of crops. This part, however, and all of the organic part, cannot form so certain a foundation for our reasoning, as can be laid upon the proportions of the various inorganic substances;

Digitized by Google

this is because the former are variable and liable to be decreased, not only by the consumption of plants, but also by the inevitable decomposition of the vegetable substances themselves, consequent upon the cultivation of the soil.

We now turn to another important point in connection with what has been stated relative to these soils. The quantity of ash contained in the grain, and even in the straw of wheat, has been mentioned as proportionally small, in the former about two per cent., and in the latter about six. When this two pounds in one hundred of the grain is divided into its several constituents, by means of chemical analysis, the quantity of each becomes very small, and in a bushel of course still smaller. Thus the amount of phosphoric acid in a bushel of wheat would not be more than one pound; of potash and soda together about one-fourth of a pound; of lime and magnesia about one-tenth. These weights seem perfectly trifling, and it may be thought that such coincidences as those that I have mentioned are merely accidental, and not to be depended upon as a guide in practice. It may be said, that even allowing these substances to be necessary, there might quite enough of them be found in any ordinary soil for the wants of any crop. Are not all soils nearly alike as to these smaller portions of their weight? This is an important question, and moreover, one to which we can return a very satisfactory answer. I will call your attention, in this connection, to the soil No. 4, in table two

This soil was also analyzed by Dr. Anderson, and is a specimen of what the Scotch farmers call a deaf soil; that is a soil which refuses to produce good crops under any of the ordinary modes of treatment, and which does not seem to hear, as common soils do, even the persuasive voice of manures.

In comparing the analysis of this with that of the three preceding soils, we are able to point out some remarkable differences. As to silica and alumina, there is nothing special to be noticed; the quantity of iron is larger, and a portion of this is in a different state from that in which it commonly exists. Lime and magnesia are not materially less than in Nos. 1 and 2, but potash and soda are in very greatly reduced quantities, there being of the two together not more than about one-fourth of one per cent. This is still two and a half tons per acre, and is abundant for the actual supply of the plant; but potash and soda are supposed to perform a variety of functions in the soil; they have a remarkable solvent power, and are known to act beneficially in making substances otherwise insoluble quite soluble, and at once available to the plant. For this reason the above small quantity joined with other deficiencies, may be reckoned among the chief defects of this soil.

Digitized by Google

Sulphuric acid is entirely absent. This does not seem to be of so much importance to the grain, but forms a considerable proportion in the ash of the straw. The next deficiency is that of phosphoric acid, of which substance only a mere trace could be detected; so small a quantity that its precise amount could not be determined by the most delicate chemical processes, the accuracy of which it may be mentioned, extends to dividing a grain into one thousand parts. Here then is the very point which theory would have indicated, established by actual experiment. Phosphoric acid abounds above everything else in the ash of wheat, and it is found to be almost entirely absent in a soil which will not produce a good crop of this grain, even under liberal treatment. Could there be a more beautiful illustration of the principle that I have been endeavoring to sustain, and to impress upon you. This soil, No. 4, has a percentage of organic matter, about equal to the largest in the other three; it is not far from equal in its proportions of iron, alumina and silica. There is no deficiency of lime and magnesia, and even of potash and soda it might be said that there is enough to supply the wants of a few crops at least. The most striking deficiency then, is in phosphoric acid, and it is the very deficiency for which we should naturally have looked, after carefully studying the ash of the plant itself.

It is necessary for me to be guarded in my statements, and I must therefore say that one qualification is here necessary. In a vast majority of cases, when wheat refuses to grow on a soil that formerly produced it, the cause may be looked for in a deficiency of some inorganic substance. Exceptions are so rare that this may be considered a general rule. But in soils which when plowed for the first time, refuse to grow this crop, it may possibly happen that there are reasons of another nature.

1. All of the substances necessary may be present, and the land according to analyses be even richer than No. 2 in the table, and yet utterly refuse to produce even a tolerable crop. The difficulty now is in the physical character, and not in the chemical composition. There may be too much water, so that the land is never at a proper temperature, and so that the proper chemical changes cannot occur, the plant being thereby prevented from obtaining its nourishment. An easy and effectual remedy for this state of things, is to be found in the under drain, the effect of which upon such land, is at once to double, or often to quadruple its value. Another physical difficulty arises from imperfect and shallow plowing; the surface only is rudely stirred, and if the subsoil be hard, the plants cannot penetrate into it, hence, however good the soil may naturally be, as soon as dry weather commences, and the surface becomes parched, they perish for want

Digitized by Google

of sustenance, because they cannot go deep for it. Here the remedy is in thorough plowing and subsoiling, which will render the soil mellow and accessible to a considerable depth.

2. There is another not very uncommon cause of barrenness, even when all of the necessary substances are present. Some one of them may be in too large quantity. It is a curious fact that many of those substances which in small quantities are most powerful manures for plants, act as deadly poisons if present in large quantities. Three or four hundred weight of guano per acre effects an excellent purpose, but a couple of tons would scorch and destroy everything. Even barn-yard manure may be put on so as to have a highly injurious effect. Iron is more commonly in hurtful excess than any other substance. In some soils the quantity is so great as to choke the drains where it is deposited, from the water that passes through them. Common salt is also occasionally too abundant, but very seldom.

These are all exceptional cases, mentioned for the purpose of guarding myself from any imputation of speaking too positively, and laying down too broad a rule. With such exceptions the general fact is as I have stated it, that where wheat does not grow well, it is owing to a chemical deficiency in the soil. What this deficiency is can be clearly ascertained by a chemical analysis, but this must be done by a skilful and careful operator, it being obvious that any other would fail to note all of the minute, yet most important points, that are so fully brought out in the above analysis.

But we may do much by simply reasoning upon the evidence presented without going farther. We all know that it is the *grain* which is sold and carried away from most farms, the *straw*, in one way and another, usually getting back to the land. It is then clearly to the composition of the grain that we must look for an explanation of our difficulties, in attempting to restore our exhausted land to fertility. What was the substance which was found to be most abundant in the ash of this part?—all will remember that it was phosphoric acid. This is, according to Table II, one of the least abundant substances in the soil, and is, therefore, likely, under the demand upon it for the formation of the grain, to be soonest exhausted. Ordinary manures contain phosphates, but the great bulk of them is straw, which is from Table I, not rich in phosphoric acid. *There* is a special deficiency in the soil, a common manure does not contain enough of the particular substance needed to supply it in sufficient quantity for the wants of the crop. Much more must be present than the plant actually needs, in order that it may be obtained with facility.

On all worn out or failing wheat lands, the experiment of adding phosphates, may be tried with great probability of success; that is, some com-

Digitized by Google

bination of phosphoric acid in addition to half or two-thirds the usual allowance of common manures. The cheapest and most convenient source of phosphoric acid for farm purposes, is found in bones, which consist in great part of phosphate of lime. Two or three bushels of these, dissolved in sulphuric acid, or in place of this seven or eight bushels of bone dust, or ground bones, will be an ample application for an acre; it is a cheap remedy, and one that, as all can now see for themselves, can be tried with strong probability of success. Guano, where it can be had, is also an excellent special manure; it is to be used at the rate of about two hundred weight per acre, with half the usual dressing of barn-yard manure. Good guano contains about one-third of its weight of phosphate of lime, and some samples much more than that.

It is to be observed that I do not recommend phosphates as a specific in all cases; the defect may in some instances be of another character entirely, but I do say that for the larger portion of our land they will be found remarkably efficacious.

I will not fatigue my audience by pursuing this subject at greater length; enough has, I think, been said, to illustrate and sustain the position which was assumed in the commencement, that in any department of agriculture much was to be learned, and much still remained unknown. The subject taken to-day is certainly a fair test, for our authentic accounts of the cultivation of wheat as food for man, extend back even to the old Testament records of the Bible. Some of this grain is now in cultivation, which was deposited in the catacombs of Egypt three thousand years ago; surely this is a crop regarding which everything ought to be known, if the subject of agriculture has been properly studied; that it has not been, until within a short period, the facts given to-day may witness, for nearly all of them are products of the present century, and by far the greater part of the last few years. It appears almost superfluous to spend time in farther demonstrating the usefulness of the information which the labors of scientific men are thus developing and diffusing; it would seem that no practical man could hesitate for an instant in deciding upon its importance. If it is advantageous to know whether his tools are constructed upon proper principles, so as to do the best work with the least amount of labor, it follows inevitably that it is advantageous to know the constitution of his soil also, that he may avoid injuring it by improper treatment, and may supply its wants in the most economical manner. The same thing is true as to the composition of the plant. There is, in fact, no man to whom a thorough knowledge of his profession, in all its theoretical as well as practical bearings, is more necessary than to the farmer. All of his daily pursuits are interwoven with science,

Digitized by Google

whether he will or not, and it rests with himself to say if science shall remain neglected, or shall prove a ready and powerful helper.

If the single fact which I mentioned a few moments since, relative to the phosphates, were known and acted upon by the mass of our famers, according to the principles and practice suggested, what an immense increase in the yield of wheat would result. If it had been known twenty years ago, how much of our fertile land now ruined for wheat, would still be luxuriant in its produce.

Forty bushels of wheat to the acre, it will be recollected, carry off about sixty pounds of phosphoric acid; the whole of this would be more than replaced by three or four bushels of bones. The land might thus, so far as this important substance is concerned, be kept from deteriorating for an indefinite length of time. It is so with all the constituents of a soil; by watchfulness and yearly additions, or at least frequent additions of comparatively small quantities, it may be kept up with little outlay; but when once run down, heavy expenses are involved in the attempt to restore its fertility; and this is a fact which I would wish to impress upon the mind of every farmer in this western country. It is in most parts a perfect garden for fertility. In riding a hundred miles there is scarcely an acre that cannot be cultivated; it is rich, and with good cultivation affords most bountiful returns; a little knowledge, a little foresight, a little exertion, and a trifling annual expenditure, will keep it fertile forever.

That eminent English chemist who visited us last year, has said since his return, that we should cease growing wheat in this region very soon, and that we were sowing our wheat land to grass; this might prove true under the exhausting system which is pursued by too many farmers, but we do not believe such a system is to last; we see that already on numerous farms the yield of wheat is beginning to increase, and that in many instances it comes up to the best recorded English crops.

If the farmers of this region will only take hold of this subject in earnest, five or ten years hence, will see our hill sides and valleys waving with such crops of golden grain, as have never been exceeded by these soils, even in their first virgin richness. Our English friends are exceedingly mistaken, if they think that we are about to give up, and to sow grass seed, because a part of our land has begun to fail. The seed that we sow will be a kind of grass seed that will appear in their markets, when the starving multitudes begin to cry out for bread in time of scarcity; when their heavens look dark, and their sky is cold, we will pour it forth from our soil which refuses to grow wheat, and have no fear but that it will be found nutritious.

Digitized by Google

The whole expanse of our Union, gentlemen, does not offer a more advantageous field for the farmer, than this of central New-York. We who come out here from the rocky hills of New England, look upon such a country with unmingled admiration. Compared with what we have to do, to ensure a crop, every thing here is almost entirely spontaneous in its growth. What result would not an equal amount of labor produce among you, where soil and climate seem to unite, in favoring the labors of the agriculturist?

That you are improving in this county I have no doubt, from the common report which meets me in other sections, and from the presence in your midst of such examples of pre-eminent enterprise, skill and foresight, as your respected president, and others whom I might mention, were it not for fear of instituting invidious comparisons.

Your president spoke last evening with befitting indignation, of the term old Seneca, which has been elsewhere applied to this county, and aptly likened it to a young blooming maiden, just beginning to disclose what may be the perfection of her matured charms. Such is a kindred feeling, which has been growing in my own mind since this morning, when I was told that the man is yet living in this town, or neighborhood, yes even now perhaps, within the sound of my voice, who turned the first furrow in Seneca county. We have been accustomed to consider single lifetimes as short measures, in the growth of communities, but here in this western land they become long measures, when we see the men living who penetrated an unbroken wilderness. Since that pioneer of civilization first turned up the untrodden sod, what a change has occurred. Within the period of his remembrance, the whole face of the country has been overspread with neat thriving villages, and green smiling fields, has been made the abode of a free, industrious, and intelligent people.

If such has been the improvement in one lifetime, under the disadvantages of a new country, and imperfect facilities of education; what a garden—should her sons avail themselves of every facility for acquiring knowledge, and endeavor to open new avenues for it, may not this county of Seneca become, when we, who are yet young, and who are permitted to live to old age, shall say in our declining years to almost incredulous hearers, that we have seen the man who traced the first mark of civilised industry on the face of this fair and goodly land.

When the professor concluded his address a sincere and hearty vote of thanks was warmly expressed, and a copy requested for publication.

The reports of the committees on the objects presented for pre-

Digitized by Google

miums, were read and the successful candidates received their respective awards.

Long after the light of day had departed the halls were thronged with happy people, and the remembrance of the fair in 1850, will not be forgotten until improvements in products shall be extended, and a large number of farmers and their friends be collected under happier auspices.

H. D. DIDAMA, *Secretary,*
of the Seneca County Agricultural Society.

Fruit Trees and Fruit.

Admitting that the products of the soil most important to man, are the cereal grains, with the vegetable or esculent roots; yet fruits may be considered next in rank as conducing to his health and comfort, and useful in domestic economy.

It has been remarked that choice fine fruits are known to few persons; that the mass of even well informed persons, are unacquainted with the best varieties of fruits. If such is the fact it is not surprising that this agreeable department of cultivation has made slow progress.

A mistaken opinion has long prevailed among farmers, that fruits were an expensive luxury; a most singular error to exist among an observing people, an error, however which is fast fading from the land, with other relics of ignorance. The large profits of the New-Jersey farmers obtained from peaches, while they cultivated *choice* fruit, proved the benefit of fruit culture; pears, apples, cherries and plums were equally profitable. Thirty dollars have been paid for the crop of a single pear tree, and many a peach tree yielded a profit of from ten to twelve dollars. The smaller fruits, such as strawberries and raspberries, have always been very profitable, for the short period of enjoyment gives them, like other novelties, an enhanced value.

The diminished profits of the fruit-growers of New-Jersey in 1850, proves another useful fact, that poor fruit, neglected trees, and the omission to procure and propagate *the choicest fruits*, are sources of wasteful extravagance and unnecessary loss, for it was ascertained that when good fruit was offered in market, large prices were obtained; now, when indifferent fruit is presented to the people, it is utterly refused. The indifference which for many years prevailed among farmers in relation to fruit, prevented nurserymen from exercising that judgment and liberality which is essentially needful to procure the most rare and choice fruits of the various species. Apples indeed, of rare excellence could be obtained, but all other fruits were generally indifferent. Now and then an enterprising individual might be found, being

Digitized by Google

a rare exception to the general rule. In the counties of western New-York more attention has been given to the culture of fruit in the last ten years, than any antecedent period. In the county of Seneca almost every farm has now its plantation of young fruit trees, which if well chosen as to varieties, and carefully attended to for a few years, will make this region as celebrated for its delicious fruits as it now is for its rich grains.

With the market of Geneva on the border, and with the growing towns of Waterloo, Seneca-Falls, Bearytown, Canoga, Romulus and Ovid, in each of which luxury is indulged when utility is an accompaniment: with these and other sources for the consumption of the excess of produce, the good and provident farmer cannot fail to obtain a profit upon any capital invested in the culture of fruit.

It must be remembered also, that an indirect profit of much consideration is derived from the economy of a large supply of fruit to every member of a farmer's household. These wholesome articles lessen materially the cost of the table, while they administer to the health and vigor of all. This system has been tried with success. A farmer caused his men to be supplied freely with apples, cooked and uncooked, as long as apples could be preserved, which is generally from August until the following May. In their season each man had his daily bowl of strawberries and milk, and raspberries were furnished in their turn; the result is a uniformly happy family, always contented, ever cheerful and healthy, and not a man has been sick or unfit for active labor during the space of seven years. With these and other inducements, the cultivators of fruit are increasing rapidly in the county, and it seems evident that the action of the State Agricultural Society in relation to pomology has awakened a lively interest in every town.

The influence of climate on fruit trees and fruit has not received sufficient attention and observation, hence may be discovered the source of failure in many attempts involving loss and disappointment. Cherries generally succeed well, as they vary but little if any by a change of position, and if effected with due care. Apples vary essentially, and peach trees brought from southern climes to this latitude prove worthless. The peach is not indigenous to this climate. It was first introduced into England from Persia in 1562, and into this country, at an early day after the discovery, by Hudson. It has been supposed that this tree endures in its native soil for a period of forty years, yet in this country injuries from the worm and frosts rarely permit them to exist beyond twelve years. From these causes the luxury of a rare fine peach can only be indulged in occasionally, and but for a few seasons from the same tree. The delicate germ of the fruit

Digitized by Google

cannot endure the late frosts in spring, and the early frosts of autumn are too severe for the tender, new formed wood of a short summer. Constant care to renew the plantations in part, every year, is necessary to continue this delicious fruit—a care which costs but a trifle to the forehanded farmer, and repays him largely in pleasure or profit.

The pear tree is also sensibly affected by climate. No fruit suffers more than the pear; its very form is sometimes changed, and its flavor lost by removal. The pear tree grows wild in many parts of Europe, but its cultivation was more carefully encouraged in France and northern Italy than elsewhere. This tree is liable to injury from frosts and disease, yet with ordinary care, excellent fruit of many varieties will reward the farmer's skill. With the drawbacks alluded to, this county is well situated for the cultivation of fine choice fruit. The difficulties are named to show the necessity for care in the selection of varieties adapted to the climate, as well as attention to the soil and caution in after culture.

It cannot be doubted that the design of the Creator, in the formation of plants, was the perfection and preservation of the seeds. When this design is complete, the parts which have contributed to the object are left for the use of man; thus with peaches, the seed for propagating the species is imbedded in a substance which nourishes the kernel by vessels passing through the hard shell, whose channels are readily seen on the peach stone. After the kernel is matured the stone or shell becomes hard, the vessels cease to act, and then the substance which has served as food and nourishment to the seed, becomes an agreeable food to man. The same action occurs in the apple and the pear. In other fruits the seed is imbedded or studded in a pulpy flesh, like the strawberry and raspberry; none, however, are fitted for food until the first design of nature is accomplished in the ripening of the seed. It is unwholesome, and sickness, disease, and occasionally death is the penalty for interfering with the designs of the Allwise Creator.

It seems clear then that when fruit trees or plants are removed from one climate to another, any excess of action, whether of heat or cold, which disturbs the functions of the fruit, must prevent a due development of the seed, and consequently prevent its fleshy or pulpy substances being innocent or refreshing food. Cautious observation must therefore be exercised by every farmer, who would enjoy these comforts and pleasures, or rather blessings, which from their extent and common character, is like the sleep which refreshes, or the bread which nourishes. They are received in too many instances without gratitude, without that expression of love and thankfulness which should ever tremble on the lip.

Digitized by Google

Education.

In a system of education, whereby man shall be taught to command himself, to hold a power over the passions, and to perform every duty will be found the best preventive of error and crime; the full security of property and person, and the germ of national happiness and prosperity.

Whatever system of instruction is devised, which offers to the people an education, conveying to them the above principles, must occupy the minds of legislators of this country, until the great and desirable object is accomplished.

No reasonable or observing man can doubt the benefits derived from the system of common schools, nor is there room to doubt they have been a powerful element in the elevation of this State to the position now happily enjoyed. Great as the benefits are, it seems more and more evident that with the increase of population an increase of facilities is necessary, and a clearer insight into the sources from whence the means shall be derived to maintain a system, which brings to every human being in the State a more or less direct share of blessings produced.

It is not in accordance with the character of this work to discuss questions of public policy, yet as the county has always evinced an abiding interest in the instruction and education of her youth, a few facts connected with the general subject may be useful.

In ancient days schools were unknown, parents alone instructed and educated their children; a few private schools existed two thousand years ago; they were confined to particular classes, or were the offspring of special motive or individual object. The first public school system was founded, probably in the year A. D. 150, and in time Athens became the school of attraction, drawing young men from all parts of Europe. When christianity was established, schools were chiefly conducted and controled by the clergy, the principal objects of which were the instruction of young men for the clerical profession.

After the sixth century, the conventual schools in a degree superceded most others, and flourished from the sixth to the eleventh century; it was within this period that the school at Armagh, in Ireland, and at York and Westminster, in England, were most famous. The cathedral and conventual schools were rivals, the first more careful of the priesthood, the latter more attentive to general instruction.

Charlemagne seemed to have first conceived the idea of *national* instruction, for in the year 789 he established *parish* schools for the general use of the people; he gave a personal superintendence to the schools, at times giving addresses to the pupils. With the death of Charlemagne, and the disputes of his successors, the parish schools fell into decay and disuse. In

Digitized by Google

Syria, Africa, and parts of Europe, the Jews had carefully preserved the remains of ancient learning. Arabian schools were established in the ninth century, and among the Moors of Spain were the first to cultivate successfully, and send forth to the world a knowledge of mathematics and medicine. Arabic physicians taught in the schools of France, and the works of the Saracens were eagerly sought as text-books in mathematics and natural history.

About the year 1158, academical privileges were found to confer distinction and honor, and became the stimuli for originating and founding universities. During the sixteenth century the influence of the reformation on the schools was extensive and important; knowledge was no longer exclusive,—freedom of thought and the new power of printing broke the fetters which had chained the common mind, and drew aside the veil which so long had shaded the eye; schools now obtained form and system, yet circumstances combined to place the benefits of new institutions among the wealthy and persons of talent. The wars of Europe and the evil effects of fanaticism retarded the progress of knowledge, and obliterated much of the good which had been accomplished. In the seventeenth century Lord Bacon and other men of powerful minds, exerted their influence to promote knowledge. Germany became active and decided in all measures for the advancement of science and literature, and has done more for schools than any other nation of Europe. In France, discord and unstable government interfered with general instruction, exhibiting at times the direful outrages which ignorance ever cherishes. In England the school system continues at this day largely to partake of the monastic character; though strenuous exertions have been made, and with partial success, to introduce popular education.

In the United States, popular education has deservedly received all practicable aid and attention, and possesses, probably, the most effective system. Education is here deemed the only source of true distinction among men; the useful application of mind gives to the possessor a value or estimation, greater than can be attained by a less gifted individual. Intellect being the means of elevation or preference, good works and merit with application are the incentives to attain the prize, by an unceasing cultivation of the mind. The attainment once achieved, man has perfect enjoyment, and his reward for honorable ambition and labor.

In the United States this is the natural position of all men, and hence the great efforts exerted, nationally and individually, to extend and secure every avenue leading to instruction and education, to open wide every door to knowledge, to court the introduction of every art and science.

The history of schools from the earliest ages, presents useful lessons to the people of this State, when considering how to promote the general happiness

Digitized by Google

and to perpetuate the inestimable privileges of liberty and self-government. The experience of the past, proves that wise men use and embrace study for the good of their fellow men; while crafty and designing persons, de spise, or *pretend* to despise all study and knowledge; using ignorance as a coward's shield in case of need.

Consulting truth and reason, wise men are convinced that knowledge is the preservation of virtue, and when attended with good habits it is a sure and abiding source of happiness. Entertaining such views, the system of free schools in the eastern States and common schools in the State of New-York, have received the hearty support of the people, producing results honorable, extensive, and commensurate with the high expectations of the wise and good.

When contrasted with institutions of European nations, the cords of affection are drawn closer, around the principles and systems of this country: which though not perfect, may at an early day, be so ordered by calm, unprejudiced men, that the dearest interests of mankind will be promoted and maintained, introducing useful knowledge into the habitations of the poorest and the richest, so substantial and enduring, that every recipient may bless the land he lives in, and the paternal government of the people, which while it protects, distributes its genial influences alike on all.

The great obstacle to the diffusion of instruction and education in Great Britain, has been the pretension of the many and various religious denominations, to combine their own peculiar notions, with the secular rudiments of the schools, creating a difficulty addressed more often to the passions, than to the judgment of the masses, and every throb and throe rendering it more difficult to determine between worldly, selfish, and spiritual interests of human beings.

In this country where all sects, and every religious denomination are permitted freely and openly to enjoy their peculiar views, yet where no one association has any constitutional or rightful precedence: where each is estimated by the great body of the people according to its influences and power to lead men to the full observance of the moral law of God; it is reasonable to expect that the miasm of sectarianism prevailing in England and Scotland, and other nations, will not be permitted in this State to neutralize or diminish, the free principles, and ennobling energies of common schools and free schools. The amount of ignorance existing in Britain, where no common school system has been established, is deplorable, and contrasts strongly with the intelligence of the masses of this State. It is calculated that, about eight millions of persons in England and Wales, cannot read or write. This is about one-half the population of those countries.

Digitized by Google

Of all the children in England and Wales, between the ages of five and fourteen, more than half the number do not attend any school. Among those who do receive instruction from charities or other sources, the amount is of little practical value to the poorer classes: a little reading and writing imperfectly learned, with a garbled history of the scriptures, is all the poorer children carry with them from school. The very farmers themselves of England and Wales, cannot in many instances read or write, and what little even they might have learned in the days of their imperfect instruction, has passed away, more because of the fatal mode of education than because of any inaptitude in themselves.* In the year 1849, more than thirty thousand individuals were committed for crime; of this vast number, nine thousand seven hundred could neither read or write, and only eighty-one had received a good education.

In the State of New-York, the whole number of persons convicted of crimes for a period of *eight years*, (1840—1848,) was 27,947. The yearly average being 3,493–4, of the *whole* number 1,182 had received a a common education, 414 had a tolerable good education, and only 128 were well educated. The remaining number, 26,225, were generally destitute of education, none being able to do more than to read and write with difficulty.

In Great Britain, the causes of crime are assigned to the great and continual neglect of intellectual training of the masses, and to the neglect of all religious education. In this State, the very favorable comparison which it bears with Great Britain, may be attributed to the greater attention given to the intellectual training of the people, though it is yet very far from the perfect system due to them. These general facts have received the attention of the Legislature of this State: the inhabitants of the county of Seneca, are not behind any other county or place, in in their high appreciation of the benefits of instruction and education. Knowledge is here esteemed as the great and broad platform of wisdom, from whence all may be raised to an understanding of the works, which display the infinite wisdom and goodness of the Creator: from whence flows the streams of skill and design calculated to promote the happiness of man. From this platform is derived the great science of duty, in every relation of life. It is this platform which should be free of access to all, and every approach made gentle and easy. The imperfections of human nature interpose obstacles to the equal advance of all who would willingly learn the science of duty; hence the difficulty of perfecting a system which shall be just while it is generous in aiding the feeble to run the race with the strong.

*Ksy.

Digitized by Google

In this county there are about 8,500 children needing instruction and education. About one hundred and eight district common schools open their doors for instruction for an average period of eight months and a half during the year; and about twenty-five private or select schools, and two incorporated academies are open to those who prefer their systems.

The two academies receive from State patronage about $800 per annum: instructing about 200 students. The 108 common schools receive from the State $4,700, and give instruction to 8,000 pupils. Thus it appears that each academic pupil is presented with a donation of four dollars, while the district school pupil receives but fifty-eight cents. This is viewed by many as an unjust appropriation of funds, applicable to the common good, share and share alike.

Another source of uneasiness is found in the still greater disproportion of State patronage as exhibited in the donations to pupils who occupy their time in colleges; the difference is alleged to be as fifty dollars is to about fifty cents, and so far adverse to the popular schools. The munificence of individuals in the endowment of colleges is noble and worthy of all praise: it deserves encouragement, and cannot fail of its high reward, in the distinction eminently due, and freely bestowed on the benefactor by all upright, intelligent men. The colleges and universities are strong in the affections of the people, for it is well known that the State owes many of its gifted intellectual men to the energy and powers of those who adorn the various professorships; yet as colleges and universities are beneficial to the few, while common or free schools are for the many: as the former are the favored objects of private endowment, and as the common or free schools have no resources beyond the funds meted out in limited measure by statute: the existing system is deemed by many unreasonably partial; and not calculated to elevate the standard of instruction and education desirable and necessary for the people.

The arguments in favor of a liberal public support to the higher halls of education are cogent, and deserve full consideration: no enlightened man would be willing to diminish their usefulness for they aid essentially in maintaining an equality of intellectual vigor between the best educated men of other nations and of the United States: claiming and securing for the nation collectively and individually a consideration and respect derivable only from education well directed and highly maintained.

Entertaining liberal views toward or in favor of every class of citizens; the farmers of Seneca county have indulged an ardent hope that, as an important portion of the whole body, their sons would share in the benefits of education equally with other important classes, by the organization of a college

Digitized by Google

devoted to the dissemination of knowledge, especially applicable to agriculture, to that employment of science and art, upon which this State has risen to her present high condition, and upon which, it must depend for its support and continuance.

Many were the humbled and mortified spirits who lamented the fate of the bill laid before the last Legislative session for an agricultural college: a mortification rendered more severe by the strong assurance of the comptroller of the State, who, in his report of the 3d of January, gave utterance to these cheerful and encouraging words, "the financial condition of the State is in a high degree prosperous and encouraging. The public credit is untarnished, and our securities command an unusual premium at home and abroad. Our internal improvements continue to yield a rich and increasing income. The funds devoted to education are productive, and amply sufficient to ensure a free dissemination of knowledge among the people during all coming time."

Digitized by Google

APPENDIX.

Analysis of Native Alum from the falls of Lodi.

Opaque, whitish yellow masses, resembling bunches of grapes, (botryoidal,) lining cavities on the surface of the shale, and containing small particles of the weathered rock included in the incrustation. These could not be fully separated from the saline mass, and are included in the analysis under the head of decomposed shale. 100 parts of the mineral consisted of

Moisture and a trace of sulphur,	56.60
Decomposed shale,	4.05
Sulphuric acid,	29.72
Alumina,	6.
Peroxide of iron,	1.94
Oxide of manganese,	.24
Magnesia,	.99
Lime,	.46
	100.

Analysis of water-lime on the farm of Mr. Frederick Swaby, at Seneca Falls.

Composition of 100 parts:

Soluble in acid—Silica,		4.
	Alumina,	4.5
	Peroxide of iron,	.5
	Carbonate of lime,	15.
	Magnesia,	11.
	Oxide of manganese,	2.
		37.
Insoluble in acid—Silica,		63.
	Alumina,	
	Oxide of iron,	
		100.

Apparently there is too much silica, and too small a proportion of lime to make a superior hydraulic stone.

Analysis of the Seneca county limestones.

No. 1 was taken from the quarry of Enoch Chamberlain, Fayette.
2 do do Thompson Johnson, Romulus.
3 do do Anthony Lerch, Fayette.

Digitized by Google

No. 4 was taken from the quarry of Lot 74, near Seneca Falls.
5 was taken from the ravine on Mr. Scoby's farm, Romulus.
6 do cascade near Baileytown, Ovid.
7 do A. Moorhouse's quarry, Covert.
8 do James Rorison, (No. 1,) Fayette.
9 do do (No. 2,) Fayette.

	No. 1.	2.	3.	4.	5.	6.	7.	8. (No.1.)	9. (No.2)
Insoluble sand and clay,.....	6.7	15.	54.	11.	78.	4.	16.65	20.	16.16
Alumina and per oxide of iron,..	1.4	23.	3.3	27.	9.	26.	3.	1.65	1.69
Carbonate of lime,.....	90.	53.5	35.	36.6	11.	60.	60.30	66.75	72.15
Magnesia, ...	1.5	2.8	3.0	26.4	2.	5.5	15.65	19.	6.
Oxide of manganese,.....	....	....	trace	....	....	1.9	....	....	....
Soluble saline matter,.....	1.4	1.2	1.6	....	....	2.4	4.40	1.70	4.15
Phosphoric acid,.....	trace	trace	trace	....	....	.1	trace	trace	trace

The superiority of Fayette limestone for the purposes of burning, is evident in No. 1, and No. 9, as shown by the preponderance of lime. No. 2 is the Tully limestone, near to Ovid, and No. 6 is the same stone, from the western limit of the bed. No. 5 is probably the same bed, on the eastern side of the county, but it contains a large quantity of dark colored silica resembling basanite. No. 3 is one of those intermediate shaly limestones full of fossil coral impressions. No. 4, is a magnesian limestone from the Gypsum group. It would make a hydraulic lime. The portion analysed from Mr. Moorhouse's quarry (No. 7,) was taken from the bottom tier, about five feet back from the face of the rock.

The samples from Mr. Rorison's quarry in Fayette were taken from different tiers, No. 8 being called the flint course, and No. 9 being known as the upper arch course; the arches of kilns being constructed with this stone. The quantity of magnesia present in Nos. 7, 8, 9, is remarkable, approaching in composition to the hydraulic limestones.

Analysis of Seneca county marls.

No. 1 is from the farm of Mr. A. Moorhouse, in Covert.
2 do Mr. Andrew Dunlap, Jr., Ovid.
3 do Mr. Rich. V. Dey, Fayette.
4 do Mr. H. T. E. Foster, Fayette.
5, 6, 7 do Mr. A. Moorhouse, Covert.

	No. 1.	2.	3.	4.	5.	6.	7.
Moisture, ...	4.50	2.50	1.	2.71	3.46	9.96	8.67
Organic matter,.....	8.50	.90	4.20	4.32	1.65	2.12	3 10
Insoluble sand,.....	6.60	11.70	6.	5.58	5.	13.	26.65
Carbonate of lime,.....	77.10	79.40	83.23	82.98	83.35	67.20	56.60
Magnesia, ...	2.10	3.50	2.16	3.60	4.	3.	1.6

Digitized by Google

	No. 1.	2.	3.	4.	5.	6.	7.
Phosphoric acid,	1.20	2.	2.8	.81	.86	.61	.37
Alumina,					2.	3.50	2.50
Common salt,	....	....	....	....	.20	.13	.14
Sulphate of lime,	....	....	.50	....	....	....	....
Sulphuric acid,	....	....	....	....	.46	.38	.27

Vegetable matter constitutes a large portion of No. 1, 3 and 4. No. 2 represents animal matter *only*, which in this, as well as in the other marls, is capable of yielding a small quantity of ammonia by decomposition. Each of these marls contains animal matter arising from the undecomposed remains of the bodies of the minute fresh water shelled animals. Some portion of each is a deposit of very fine calcareous matter from water. The plaster of No. 3 was probably derived from the surface water filtering through. The poorest of these marls will afford twenty-five pounds of phosphoric acid to every ton of dry and weathered marl. This is equal to forty-five pounds of phosphate of lime, a quantity found in eighty pounds of bone dust, and a quantity equal also to what a grazing cow annually takes from the land. As far then as these marls will go, they will be found valuable aids to the soil, giving so much carbonate of lime in a minute state of division and supplying a dressing of phosphates at a cheap rate.

The samples marked Nos. 5, 6 and 7, were not analyzed until sometime after the previous numbers. The bed being extensive, portions were taken from it at various depths. No. 5 was taken four feet below the surface, and was the whitest in color. No. 6 was eighteen inches below the surface, and the darkest. No. 7 was from the deepest part of the bed, and six feet from the surface.

The organic matter in these specimens is almost wholly vegetable, carried through and deposited with the fine earthy carbonates. This is the source also of the silicates and earthy matter.

No. 7 appears to be a deposite of fine lime-mud, with few of the minute shells peculiar to marls. No. 5 has a greater proportion, and is altogether the best for agricultural purposes. No. 6 is contaminated with vegetable matter and clay from the surface.

They are all rich in lime and magnesia. The proportion of phosphoric acid points them out as a valuable source for supplying this important element; for it may be estimated that in a ton of marl No. 5, there would be seventeen pounds of phosphoric acid, which is equal to thirty-six pounds of bone earth—the quantity found in fifty pounds of bone dust.

No. 6 would furnish twelve pounds of phosphoric acid, and No. 7 could supply seven and a half pounds. This last proportion is more than a crop of wheat of twenty-five bushels to each acre takes from the soil.

Digitized by Google

SOILS OF THE COUNTY OF SENECA.—Town of Fayette.

	W.A & A W. Smith	Jacob Peterson	William Sweet	Alex. Rorison	Jeremiah Opdyke	Rich. V. Dey	Robert Straughn	John Johnson	Robt. J Swan	John Delafield	E. Chamberlain	Cyrus Gurnsey	S. Stringham	A. J. Esterly
	1	2	3*	4	5	6	7	8	9†	10	11	12	13	14‡
Moisture,	6 84	7.83	10.13	2.88	9.95	8.64	2 17	4.23	3.05	....	5 32	4 08	8.51	5.04
Vegetable matter,	6.57	5.76	7.64	5.90	3.61	3.0	6.35	4 0	2.80	3.81	4.0	3.32	5.26	5.34
Silica and silicates,	79.75	80.00	87.00	85.66	84.00	82.0	85.08	87.0	92.87	92.32	87.0	88.0	82.60	90.50
Alumina and peroxide of iron,	5.24	4.48	2.98	4.50	1.20	5 20	5.20	4 40	5.20	3.20	1.52	1.84	1.98	7.20
Lime,	0.72	0.48	1.18	0.40	0·36	0.40	0 60	0.10	1.32	0.34	1.48	1.02	0.94	1.20
Magnesia,	....	0.08	....	....	0.40	0.14	0.20	0.16	0.16	0.06	0.08	0.64	0.32	0 36
Sulphate of lime,	0.27	10 84	0.76	0.40	0.33	0.44	0 38	0.08	0 60	...	0·23	0.11	0·21	0.18
Common salt,	0.30	0.33	0.40	0.19	0.15	0.16	0.17	0.02	0.12	....	0.26	0.08	0.15	0.08
Potash,	}	0.08	}		0.01	}	}	}	0.02	0·22	}		0 03	0.01
Phosphoric acid,	} 0.21	0.12	} 0.04	....	....	} 0.02	} 0.05	} 0.01	....	0.01	} 0.11	0.01	trace.	....

* Whole quantity, ... 110.13 grains.
† Whole quantity, ... 106.14 do
‡ Whole quantity, ... 109.86 do

Note—In the several analyses where phosphoric acid is given combined with potash, the weight of the acid was determined accurately; the traces of potash not being obtained when existing as an alkaline phosphate, it was deemed more safe to place them in the form given. In the other cases the phosphoric acid was determined by Schultz's method, and that recommended by Fresenius and Will, and the potash separated by chloride of platinum.

Digitized by Google

SOILS OF THE COUNTY OF SENECA.—CONTINUED.

	FAYETTE.			JUNIUS.						TYRE.
	Michael Hoster.	Michael Hoster.	Henry Hoster.	Lewis Bradin.	John Coleman.	Vandemark	O. Carman.	Stephen Shear.	L. E. Moore.	Jason Smith.
	15*	16	17†	18	19	20	21	22	23‡	24§
Moisture,	3.07	.....	2.06	1.20	....	....	1.61	7.48	3.0	6.60
Vegetable matter,	3.07	4.47	3.16	4.0	4.80	4.0	3.64	4.80	3.17	4.0
Silica and silicates,	92.50	90 64	93.0	88.80	90.0	92.0	92.20	84.0	90.88	84.55
Allumina and per oxide of iron,	6.20	4 53	5.0	4.05	4.01	3.41	1.86	2.60	6.64	9.05
Lime,	1.0	0.24	1.08	0.09	0.09	0.10	0 10	0.36	1.32	0.62
Magnesia,	0.08	0.04	0.12	0.20	0.36	0.01	0.21	0.52	0.16	....
Sulphate of lime,	0.28	.....	0.23	0.10	0.30	0.33	0.20	0.15	0.64	1.13
Common salt,	0.12	0.02	0.45	0.27	0.24	0.24	0.14	9.08	0.33	0 40
Potash,	0.01	0.01	0.01	}		0.01	....	0.01	0.02	}
Phosphoric acid,	0.01	0.02	....	} 0.03	0.11	....	0.04	trace.	0.01	} 0.25

* Whole quantity, ... 106.34 grains.
† Whole quantity, ... 105.11 do
‡ Whole quantity, ... 106.17 do
§ Whole quantity, ... 106.50 do

Digitized by Google

SOILS OF THE COUNTY OF SENECA.—(CONTINUED.)

	Romulus.			Ovid.	Lodi.	Covert.				
	Ebene'r Bartlett.	Ebene'r Bartlett.	John D. Coe.	Wm. R. Schuyler.	John L. Eastman.	Nelson Noble.	Abram Rapelyea.	Truman Boardman.	V. Coles.	William Butler.
	25	26	27	28	29*	30	31	32	33	34†
Moisture,	6.43	2.59	9 78	7.39	5·00	2.05	8.69	1.52	1.19	6.40
Vegetable matter,	4.4	3.89	5 0	5.25	3.50	4 60	5·02	6.0	4.68	5.57
Silica and silicates,	82.68	87.0	77.32	83.20	92.00	86.20	82 0	88.0	91.16	91.75
Alumina and per oxide of iron,	5.25	5.35	6.40	2.95	5.68	6.0	3.40	3.36	2 40	6.24
Lime,	0.75	0.39	1.12	0.36	1.16	0.44	0.08	0.60	0.40	1.48
Magnesia,	0.03	0.02	0.10	0.09	0.28	0.36	0 32	0.16	0.08	0.12
Sulphate of lime,	0.19	0.41	0.16	0.47	0.47	0·20	0.14	0.22	0.27	0.30
Common salt,	0.18	0.12	0.12	0.23	0.40	0.12	0.13	0.11	0.10	0.12
Potash,	0.02	0.03	trace	0.06	....	0.03	0.04	0.03	0.02	0.01
Phosphoric acid,			trace		0.01					0.01

* Whole quantity, ... 108.50.
† Whole quantity, ... 112.01.

Digitized by Google

ANALYSES OF GRAIN AND GRASS SEEDS.

	Wheat.		Barley.		Oats.		Rye.		Indian Corn.		Red Clover Hay.	White Clover.	Red Top.	Spear Grass.	Rough Meadow Grass.
	Grain.	Straw.	Grain.	Straw.	Grain.	Straw.	Grain.	Straw.	Grain.	Stalks.					
Potash,	28.72	12.44	13.64	6.31	26.18	3.15	22 08	17.36	32.48	9.62	26.70	34.	4.92	15.62	9.13
Soda,	9.05	0.16	8 14	0.61			11.67	0.31		26.30	7.07	6.34	9.61	6.82	19.84
Lime,	2.81	6.70	2.62	9.53	5.95	3.15	4.93	9.06	1.44	7.98	37.09	25.72	10.03	3.51	0.05
Magnesia,	12.03	3.82	7 46	3.22	9.95	1.00	10.35	2.41	16.22	6.64	4.45	3.34	6.64	1.99	0.02
Alumina,	....	....	0.21	1·39	0.06	....	....	....	....	....	....	....	....	....	....
Silica,	1 27	65.38	27.10	70.58	2.67	76.16	0.43	64.50	1.44	26.97	4.85	16.13	41.90	56.32	35.25
Sulphuric acid,	0.24	5.82	0.10	1.63	10.45	6.46	0.98	0.83	12.77	1.19	5.98	3.86	7.30	0.20	8.91
Phosphoric acid,	49.31	3 07	38.93	3.08	43.84	1.54	49.55	2.82	44.87	17.08	8.80	5.53	13.75	14.98	19.35
Chlorine,	....	1.09	0.04	0.97	0.26	0.73	....	0.46	0.18	3.42	4.86	2.31	2.	0.86	2.44
Oxide of iron,	0.67	1.30	1.48	0.82	0.40	1.95	1.36	1.36	0.30	0.81	0.20	2.77	....	....	....
	100.91	99·50													

Digitized by Google

PRIZE ESSAY.

AGRICULTURAL DYNAMICS,

OR, THE LAWS OF MOTION AND FORCE, AS APPLIED TO THE ORDINARY PRACTICES OF FARMING.

By John J. Thomas.

Acknowledgments.—The author of this work is indebted for occasional portions of the materials to the Library of Useful Knowledge, Tomlinson's Mechanics, Hutton's Mathematics, Lardner's Cabinet Cyclopædia, Gillespie on Roads, Haswell's Engineers' Pocket-Book, and Byrnes' Dictionary of Mechanics.

INTRODUCTION.

No farm, even of moderate size, can be well furnished, without a large number of machines and implements. Scarcely any labor is performed without their assistance, from the simple operations of hoeing and spading, to the more complex work of turning the sod and driving the threshing-machine. It becomes therefore, a matter of vital importance to the farmer to be able to construct the best, or to select the best already constructed; and to apply the forces for their use to the best possible advantage.

A great loss occurs to many from the want of a correct knowledge of mechanical principles. The strength of laborers is often badly exerted by the use of unsuitable tools; and that of teams is partly lost by being ill-adjusted for the best line of draught; as, for example, by a disadvantageous attachment to the plough for forcing its wedge-like form most effectively through the soil. We may perhaps see but few instances of so great a blunder as the man committed, who fastened his smaller horse to the shorter end of the whiffletree, to balance the large horse at the longer end; or of the other man, who, when riding on horseback to mill, atop of his bag of grain, concluded to relieve the animal by dismounting and shoulder-

Digitized by Google

ing the bag himself, and then remounting. Yet instances are not uncommon, where other operations are performed to almost as great a disadvantage, and which to a person well versed in the science of mechanics, would appear nearly as strange and absurd.

The improvement of farm machines and tools within the last fifty years, has probably enabled the farmer to effect twice as much work with the same force of horses and men. Ploughs turn up the soil deeper, more evenly and perfectly, and with greater ease of draught; hoes and spades have become lighter and more efficient; grain, instead of being beaten out by the slow and laborious work of the flail, is now showered in torrents from the threshing machine; horse-rakes accomplish singly the work of many men using the old hand-rake; twelve to twenty acres of ripe grain are neatly cut in one day with a two-horse reaper; wheat drills, avoiding the tiresome drudgery of sowing by hand, are materially increasing the amount of the wheat crop; while a few farmers are making a large yearly saving by the application of horse-power to sawing wood, churning, driving washing machines, and even to ditching.

Now, these improvements were mainly effected through the knowledge of mechanical principles; and many of them would doubtless have been sooner achieved and better perfected, if these principles had been well understood by farmers. For, constantly using the machines themselves, they could have perceived just what defects existed, and by understanding the reasons of those defects, have been able to suggest the remedies, in a better manner than the mere manufacturer. Moreover, as the introduction of new and valuable machines depends greatly upon the call for them, farmers would have been prepared to decide with more confidence and certainty upon their real merits, and thus to increase and cheapen the supply of the best, and to reject the worthless.

To appreciate fully the value of such improvements, we should look at the immense amount of capital now yearly invested in farm labor, in the United States, which has been estimated at five hundred million dollars. To increase the effective force of labor only one fifth, would therefore add annually one hundred millions in the aggregate to the profits of farming; while on the other hand, if we look back fifty years to the imperfect implements then in use, we may at once perceive the vast amount now saved by the improve-

Digitized by Google

ments since made. And when, especially, we notice the condition of barbarous nations, and contrast that condition with our own—the former thinly scattered in comfortless hovels through far-stretching and gloomy forests, subsisting mainly by hunting and fishing, and often suffering from hunger and cold; the latter, blessed with smooth cultivated fields, green meadows, and golden harvests, interspersed with comfortable farm-houses; with the hum of business through populous cities, and along far-reaching lines of canals and railroads, and ships for foreign commerce, freighted with the productions of the soil, threading every channel and whitening every sea—when we observe this contrast, we cannot fail to be struck with the convincing proof that "knowledge is power," and of the loss sustained on the one hand from its absence, and the advantages on the other of availing ourselves of its accumulated stores.

PRINCIPLES OF MECHANICS—INERTIA.

Having thus briefly pointed out some of the advantages to the farmer of understanding the principles of the machines he constantly uses, we may now proceed to an examination of these principles. It will be most convenient to begin with the simpler truths of the science, proceeding as we advance, to their application in the construction of machines.

The term *matter* is applied to whatever composes those substances which we perceive with our external senses; and when we speak of a "body," we mean any thing composed of matter. Thus, wood, stone, water and metal are matter; while the mind and its qualities are not matter. A stone, a block of wood, a bag of sand, and any other mass of matter, are termed *bodies*.

There is one important quality of all material bodies, called *inertia*. This term expresses their passive state—that is, that no body (not having life) when at rest, can move itself, or when in motion can stop itself. A stone cannot commence rolling of its own accord; a carriage cannot travel on the road without being drawn; a train of cars cannot commence gliding upon the rails without the power of the locomotive.

On the contrary, a body when once set in motion, will continue in motion perpetually, unless stopped by something else. A cannon ball rolled upon the ground continues rolling, till its force is grad-

Digitized by Google

ually overcome by the resistance of the rough earth. If a polished metallic globe were set rolling swiftly on a level and polished metallic plane, it would continue in motion a long time and travel to a great distance; but still the extremely minute roughness of the surfaces with the resistance of the air, would continually diminish its speed until it would be finally stopped. A wheel made to spin on its axis continues till the friction at the axis and the impeding force of the air bring it to rest. A wheel made to spin in the large glass jar or receiver of an air-pump, out of which the air has been drawn, has been made to run a much longer time, but friction has finally overcome its force. There is no machinery made by man, free from the checking influence of friction and the air; and for this reason, no artificial means have ever devised a perpetual motion by mechanical force. But we are not without a proof that motion will continue without ceasing when nothing operates against it. The revolutions of the planets in their orbits furnish a sublime instance; where removed from all obstructions, these vast globes wheel round in their immense orbits, through successive centuries, and with unerring regularity, preserving undiminished the mighty force given them when first launched into the regions of space.

To set any body in motion, a *force* is requisite, and the heavier the body the greater must be the force. A small stone is more easily thrown by the hand than a cannon ball; speed is much more easily given to a skiff than to a large and heavy vessel. But the same force which sets a body in motion is required to stop it. Thus, a wheel or a grindstone, made to revolve rapidly, would require as great an effort of the arm to stop it suddenly, as to give it sudden motion.* An unusual exertion of the team is required in starting a loaded wagon; but when once on its way it would require the same effort of the horses to stop it, as would be required to *back* it when at rest.

Now, the force which a moving body has to continue onward, is called its *momentum*. When a force is first applied to any heavy body, it moves slowly; but the little momentum it thus acquires, added to the continued force, increases the velocity. This increase of

* In ordinary practice, this is not strictly correct, as *friction* will make some difference. This influence will be more particularly considered on a subsequent page. Its omission here does not at all alter the *principle* under consideration.

Digitized by Google

velocity is of course attended with increased momentum, which again added to the acting force, still further quickens the speed. For this reason, when a steamboat leaves the pier, and its paddle wheels commence tearing through the water, the motion, at first slow, is constantly accelerated till the increasing resistance of the water to the moving mass, becomes equal to the strength of the engine and the momentum. Were it not for the momentum of moving bodies, no speed could ever be given to any heavy body, as a carriage, boat, or train of cars.

As a large or heavy body possesses greater momentum than a small or light one, so any body moving with great speed possesses more than one moving slowly; for instance, the momentum of a rifle ball is so great as to carry it through a thick plank; while if thrown slowly, it would scarcely indent it.

This property of bodies is applied with great advantage to many practical purposes. The momentum of the hammer drives the nail into the wood; for the mere pressure of its weight would not do it, if it were an hundred times as heavy. Wedges are driven by employing the same kind of power.

Fig. 1.

The following experiment exhibits in an interesting light the power of *inertia*. Procure a thread just strong enough to bear three pounds, and hang upon it a weight of two pounds and a half. Another half pound would break it. Now tie another thread, strong enough to bear one pound, to the lower hook of the weight. If the lower thread be pulled *gradually*, the *upper* thread will of course break. But if it be pulled with a *jerk*, the *lower* thread will break. If the jerk be very sudden, the lower string will break, even if it be considerably stronger than the upper, the *inertia* of the weight requiring a great force to overcome it suddenly. The threads used in this experiment may be easily had of any desired strength by taking the finest sewing cotton, and doubling to any required extent.

The *fly-wheel*, a large and heavy wheel used to regulate the motion of machinery, derives its value from the power of inertia, or momentum, which prevents the machine from stopping suddenly when it meets with any unusual obstruction. In the common

Digitized by Google

threshing-machine, it has been found that a heavy cylinder, by acting as a fly-wheel, renders the motion steadier and less liable to become impeded by large sheaves of grain. An ignorance of this principle has sometimes proved a serious inconvenience. A farmer having occasion to raise a large quantity of water, erected a horse-pump, but at every stroke of the pump, the animal was suddenly jerked backwards and again thrown loosely forwards, as the piston fell lightly and rose heavily. A fly-wheel attached to the machinery, would have prevented this unpleasant jerking, and have enabled the horse in consequence to acccomplish more work. In the pile-driving engine, where a great weight is suddenly thrown loose from a height, the horses would be pitched forward when suddenly relieved of this load, but for the regulation of a fly-wheel, the motion of which is not quickly changed, neither from fast to slow nor from slow to fast.

An error is sometimes committed by supposing the fly-wheel actually creates power, for as much force is required to give it momentum as it afterwards imparts to the machine; it consequently only accumulates and regulates power.

A curious example of the effect of momentum is shown in the failure and success of two different modes of constructing wire fences for the boundaries of pastures. The unsuccessful mode consisted of tightly stretched wires between solid posts not more than twelve to twenty feet apart. A side strain of only a few inches was enough to snap the wires; consequently a bullock plunging blindly against them could not be quickly enough checked in his momentum, and such fences were therefore nearly useless without the heaviest wire. The successful mode was to stretch the wires well between strong and deeply set posts some hundreds of feet apart, the intervening space of wires being kept even by upright bars, but not posts. When an animal accidentally struck this fence, the great length permitted it to yield sidewise far enough to expend the momentum, without rupture; when its elasticity at once threw it back to its former place.

On rough roads, the force of inertia causes a severe strain to a loaded wagon when it strikes a stone. The horses are chafed, the wagon and harness endangered, and the load jarred from its place. This inconvenience is avoided in part by placing the box upon

Digitized by Google

springs, which by yielding to the blow, gradually lessen the effects of the shock. For carts and slowly moving lumber wagons their advantages are considerable, but much greater as the velocity and momentum increase. Even on so smooth a surface as a railroad, it was found by experiments made some years ago, that when the machinery of a locomotive was placed upon springs, it would endure the wear and tear of use four times as long as without them.

For this reason, a ton of stone, brick, or of sand, is more severe for a team than a ton of wool or hay, which possess considerable elasticity.

All bodies, when in motion, have a tendency to move forwards in a straight line. A stone thrown into the air is gradually bent from this straight course into a curve, by the attraction of the earth. When a ball is shot from a gun, the force being greater, it flies in a longer and straighter curve. A familiar example also occurs, while driving a wagon rapidly, in attempting to turn suddenly to the right or left; the tendency of the load to move straight on will sometimes cause its overthrow. An observance of this principle would prevent the error which some commit, by making sharp turns or angles in ditches and water courses; the onward tendency of the water drives it against the bank, checks its course, and wears away the earth. By giving the ditch a curve, the water is but slightly impeded, and a much larger quantity will escape through a channel of any given size.

When a grindstone is turned rapidly, the water upon its surface is thrown off by this tendency to move in straight lines. In the same way, a weight fastened to a cord, whirled by the hand, will keep the cord stretched during the revolution. The same principle causes a stone when it leaves a sling, to fly off in a line. This tendency to fly off from a revolving centre, is called *centrifugal force*. Large grindstones, driven with great velocity by machinery, are sometimes split asunder by centrifugal force.

An interesting example of the use and efficiency of momentum, is furnished by the *water-ram*, a machine for raising water, described on a subsequent page.

The *quantity* of momentum is estimated by the velocity and weight of the body taken together. Thus, a ball of two pounds weight, moves with twice the force of a one-pound ball, the speed

Digitized by Google

being equal; a ten-pound ball with ten times the force, and so on. A body moving at the rate of two feet per second, possesses twice the momentum of another of equal size with a velocity of only one foot per second. A musket ball, weighing one ounce, flying with fifty times the speed of a cannon ball weighing fifty ounces, would strike any object with equal force; or if they should meet each other from opposite directions, the momentum of both would be mutually destroyed, and they would drop to the earth.

Where the mass is very great, even if the motion is slow, the momentum is enormous. A large ship floating near a pier wall, may approach it with so small a velocity as to be scarcely perceptible, and yet the force would be enough to crush a small boat. When great weight and speed are combined, as in a railway locomotive, the force is almost irresistible. This circumstance often ensures the safety of the passengers; for as nothing is capable of instantly overcoming so powerful a momentum, when accidents occur the speed is more gradually slackened, and the passengers are not pitched suddenly forward. A light wagon, rapidly driven, possessing but little comparative force, is more suddenly arrested, and the danger is greater.

When two bodies meet from opposite directions, each sustains a shock equal to the united forces of both. Two men accidentally striking, even if walking moderately, receive each a severe blow. That is, if each were walking three miles an hour, the shock would be the same as if one at rest were struck by the other with a velocity of six miles an hour. This principle accounts for the destructive effects of two ships running foul of each other at sea; or of the collision of two opposite trains on a railroad.

The preceding principles show that a sledge, maul, or axe, will always strike more effective blows when made heavier, if not rendered unwieldy.

ATTRACTION.

1. *Gravitation.*

The earth, as is well known, is a mass of matter in the form of a globe, the diameter being upwards of 7900 miles. From its enormous size and the small portion seen from one point, the surface appears flat, except where broken into mountains and valleys.

Digitized by Google

The tendency which all bodies possess of falling towards the earth is owing to the attractive force which this great mass of matter exerts upon them. This attraction is called *gravitation*. The force with which a body is thus drawn, is the *weight* of that body.

When a stone is dropped from the hand, its velocity is at first slow, but continues to increase till it strikes the earth. This accelerated motion is precisely similar to that of a steamboat when it first leaves the wharf; the force of gravity may be compared to the driving power of the engine; and the quickened velocity of the falling stone, to the increased headway of the boat.

All bodies, whether large or small, fall equally fast, unless they are so light as to be borne up in part by the resistance of the air. In the first second of time, they fall 16 feet; in the next second, 3 times 16, or 48 feet; in the third second, 5 times 16, or 80 feet, and so on. Or, if the whole distance fallen be taken together, they fall 16 feet in one second, 4 times 16 in two seconds, 9 times 16 in three seconds, and so forth. In other words, the whole distance is equal to the square of the time. This is plainly exhibited by the following table:*

Seconds, from beginning to fall.	1	2	3	4	5	6
Whole height fallen, in feet.	16	4 × 16 or 64	9 × 16 or 144	16 × 16 or 256	25 × 16 or 400	36 × 16 or 576
Space fallen, in each second in feet.	16	3 × 16 or 48	5 × 16 or 80	7 × 16 or 112	9 × 16 or 144	11 × 16 or 176

A stone or other body will fall 1 foot in a fourth of a second, 3 feet the next fourth, 5 feet the third fourth, and seven feet the last fourth; which is the same as 4 feet in half a second, 9 feet in three-fourths of a second, and 16 feet for the whole second.

The depth of an empty well, or the height of a precipice, may be nearly ascertained by observing the time required for the fall of a stone to the bottom. The time may be measured by a stop-watch; or in its absence, a pendulum may be made by fastening a pebble to a cord, which will swing from the hand in regular vibrations of an exact second each, if the cord be 39⅛ inches long; or of a half-second each if it be 9¾ inches long.

* The distance, accurately stated, is 16 feet and one inch for the first second, and hence the numbers in the table fall a little short of the distance actually fallen.

Digitized by Google

The velocity increases simply as the time; that is, the speed in falling is twice as great in two seconds as in one; three times as great in three seconds; four times as great in four seconds, and so forth. A stone will fall four times as far in two as in one second, while its velocity will be doubled; nine times as far as in three seconds, while its velocity will be tripled, &c.

If a stone is thrown upward, its motion continues gradually to decrease, in exactly the same degree as it increases in falling. Hence the same time is required to reach its highest point, as to fall from that point back to the earth. Therefore, the velocity with which it is first projected upwards, is equal to the velocity which it attains at the moment of striking the ground. There is an exception, however, to this general rule, when the projected body is quite small, or when the height is great. The resistance of the air tends to diminish the velocity more rapidly than would else be the case, while ascending, and still further to retard it while descending. For this reason it will fall with less speed than it first arose.

The velocity of a stone after falling one second, or sixteen feet, is at the rate of thirty-two feet per second; hence if thrown upwards at that rate, it will rise just sixteen feet high. After falling three seconds, the rate is ninety-six feet, and hence if projected upwards at ninety-six feet per second, it will rise nine times sixteen feet, or one hundred and forty-four feet high. And so of other heights.

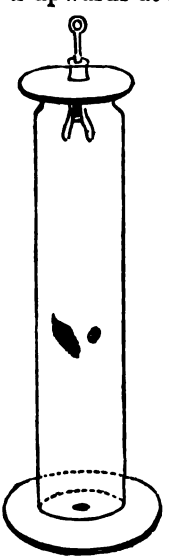


FIG. 2.

Were it not for the resistance of the air, a feather would fall as swiftly as a leaden ball. This is conclusively shown by an interesting experiment. A tall glass jar, (Fig. 2.) open at the bottom, is covered with a brass cap, fitting it air-tight. Through this cap passes an air-tight wire, which by turning, opens a small pair of pincers. Within these, are placed a feather and a half dollar; and the air is then thoroughly drawn from the receiver by means of an air-pump. The wire is turned, and the feather and coin both drop at once, and strike the bottom at the same moment.

It is not an unusual error to suppose that a large body will fall more rapidly than a small one. Some

Digitized by Google

can scarcely believe that a fifty-six pound weight will not drop with a greater velocity than a small nail; not remembering that a proportionately greater force is required to overcome the inertia and set the larger body in motion. This error existed for many centuries, from the time of Aristotle until Galileo first questioned its correctness. The celebrated experiment which established the truth on this subject, and led to the discovery of the laws of falling bodies just explained, and which formed an era in modern philosophy, is thus described in subtance by a late writer:

Called to Pisa to discharge the duties of a philosophical teacher, Galileo was not long in detecting the errors of Aristotle, which had been implicitly received for more than twenty centuries. He exposed the false philosophy, but was warned to desist from the heresy of his teachings. He gave answer to his opponents, that he was ready to relinquish his new views the moment they were shown by experiment to be false; on the other hand, he demanded of them equal candor, and proposed to refer the matter in controversy to the tribunal of experiment.

The challenge was accepted. The leaning tower of Pisa presented the most convenient position for the performance of these experiments, on which Galileo so confidently relied for triumphant demonstration of this ancient error; and thither on the appointed day the disputants repaired, each party perhaps with equal confidence. It was a great crisis in the history of human knowledge. On the one side, stood the assembled wisdom of the universities, revered for age and for science, venerable, dignified, united, and commanding. Around them thronged the multitude, and about them clustered the associations of centuries. On the other, there stood an obscure young man with no retinue of followers, without influence or station.

The hour of trial arrives. The balls to be employed are carefully weighed and strutinized to detect deception. The parties are satisfied. The one ball is exactly twice the weight of the other. The followers of Aristotle maintain that when the balls are dropped from the top of the tower, the heavy one will reach the ground in exactly half the time employed by the lighter ball. Galileo asserts that the weights of the balls do not affect their velocities, and that the times of descent will be equal. The balls are conveyed to the

Digitized by Google

summit of the lofty tower, the crowd assembles round the base—the signal is given—the balls are dropped at the same instant, and swiftly descending, at the same moment strike the earth. Again and again the experiment is repeated, with uniform results. Galileo's triumph was complete, not a shadow of doubt remained; but instead of receiving the congratulations of honest conviction, private interest, the loss of place, and the mortification of confessing false teaching, proved too strong for the candor of his adversaries. They clung to their former opinions with the tenacity of despair, and he was driven from Pisa.*

2. *Cohesion.*

The attraction of gravitation, as we have just seen, takes place between bodies at a greater or less distance from each other. There is another kind of attraction, acting only when the parts of substances are in *actual contact*. This is called *cohesion*. It is this which holds the parts of a body together and prevents it from falling to pieces. It may be shown by taking two pieces of lead, and after having made upon them two smoothly shaven surfaces with a knife, pressing them firmly together with a twisting motion. The asperities of the surfaces are thus pushed down, and the particles are brought into close contact, so that cohesion immediately takes place between them, and some force will be required to draw them asunder.† Two pieces of melted wax adhere together in the same way. Melted pitch or other similar substance, smeared thinly over the polished surfaces of metal or glass, also causes cohesion to take place between them. Smooth iron plates, two inches in diameter, have been made to stick together so firmly with hot grease, as to require, when cold, a weight of half a ton, to draw them apart. Plates of brass, of the same size, cemented by means of pitch, required 1,400 pounds. On this principle depends the efficacy of those substances, which are used for cementing broken vessels.

The most perfect artificial polish which can be given to hard

* Mitchell's Lectures.

† That this is not atmospheric pressure, like that which holds two panes of wet glass together, is shown by the fact that it requires nearly as great a force to separate them when they are placed under the exhausted receiver of an air pump. Besides this, atmospheric pressure is much weaker than this force, with so small a surface.

Digitized by Google

metals, is still so rough as to prevent the faces from coming into close contact; hence they must be either melted, or softened like iron when it is welded.

The different degrees of cohesion which take place between the particles of various soils, to re-unite them after they have been crumbled asunder, occasion the main difference between light and heavy soils. When a light soil becomes soaked with water, the particles adhere in a very slight degree; and hence when it becomes dry again it is easily worked mellow. But, if it be of a clayey nature, too much moisture softens it like melted wax; the particles are thus brought into close contact, and strong adhesion takes place. Hence the hardness, and difficulty of working such soils when again dried. This adhesion is lessened by applying sand, chip-dirt, straw, yard-manure, or by burning the earth, but more especially thorough draining, which by preventing the clay from becoming so moist and soft, prevents a strong adhesion of its parts.

Different substances are hard, soft, brittle, or elastic according to the different degrees or modes of action in the attraction of cohesion.

It is a matter of great utility in the arts to determine the different degrees of cohesion possessed by the different substances; or in other words to ascertain their *strength*. This is done by forming them into rods of equal size, and applying weights to their lower extremities sufficient to break them. The amount of weight shows their relative degrees of strength. The following table gives the weights required to break the different substances, *each being formed into a rod one quarter of an inch square:*

Woods.

Ash, toughest,	1,000 lbs.
Beech,	718 "
Box,	1,250 "
Cedar,	712 "
Chestnut,	656 "
Elm,	837 "
Locust,	1,280 "
Maple,	656 "
Oak, white,	718 "

Digitized by Google

Pine, white,	550 lbs.
" pitch,	750 "
Poplar,	437 "
Walnut,	487 "

Metals.

Steel, best,	9,370 lbs.
" soft,	7,500 "
Iron, wire,	6,440 "
" best bar,	4,690 "
" common bar,	3,750 "
" inferior bar,	1,880 "
" cast,	1,150 to 3,100 "
Copper, wire,	3,800 "
" cast,	2,030 "
Brass,	2,800 "
Platina wire,	3,300 "
Silver, cast,	2,500 "
Gold, cast,	1,250 "
Tin,	310 "
Zinc, cast,	160 "
" sheet,	1,000 "
Lead, cast,	55 "
" milled,	207 "

From these tables we may ascertain the strength of chains, rods, &c., when made of different metals; and of timbers, bars, levers, swing-trees, &c., when made of woods. Wood which will bear a very heavy weight for a minute or two, will break with two-thirds of the weight when left upon it for a long time. This explains the reason that store-house and barn timbers sometimes give way under heavy loads of grain, which have appeared at first to stand with firmness.

Although the preceding table gives the strength of wood *lengthwise*, yet the results are not greatly different when the force is applied in a *transverse* or *side*-direction.

The following table shows the results of several experiments with

Digitized by Google

with pieces of wood one foot in length, one inch square, with the weight suspended from one end:

White oak, seasoned, broke with		.....	240 lbs.
Chestnut,	"	"	170 "
White pine,	"	"	135 "
Yellow pine,	"	"	150 "
Ash,	"	"	175 "
Hickory,	"	"	270 "

A rod of good iron is about ten times as strong as the best hemp rope of the same size. The best iron wire is nearly twenty times as strong as a hemp cord.

A rope one inch in diameter, will bear about 5,000 lbs. before breaking, but in practice should not be subjected to more than half this strain, or about one ton. The strength increases or diminishes according to the size of the cross-section of the rope; thus, a cord half an inch in diameter will support one quarter as much as an inch, and a quarter inch cord one-eighth as much. A knowledge of the strength of ropes, as used by farmers in windlasses, pulleys, drawing loads, &c., would sometimes prevent serious accidents by their breaking. The following table may therefore be useful:

Diameter of rope or cord in inches.	Pounds borne with safety.	Breaking weight.
One-eighth, ...	31 lbs.	78 lbs.
One-fourth, ...	125 "	314 "
One-half, ...	500 "	1,250 "
One, ...	2,000 "	5,000 "
One and a quarter,.... ...	3,000 "	7,500 "
One and a half,.....	4,500 "	12,500 "

These results will vary about one-fourth with the quality of common hemp. Manilla is about one-half as strong as the best hemp. The latter stretches one-fifth to one-seventh before breaking.

Wood is about seven to twenty times stronger when taken engthwise with the fibres, than when a side force is exerted, so as to *split* it. The splitting of timber or wood for fuel is however accomplished with a comparatively small power, by use of wedges, the force of heavy blows, and the leverage of the two parts.

The attraction of cohesion is very weak in liquids; it is sufficient, however, to give a round or spherical shape to very small portions or

Digitized by Google

single drops, and to furnish a beautiful illustration, on a minute scale, of the same principle which gives a rounded form to the surface of the sea. In one case, cohesion by drawing towards a common centre, forms the minute globule of dew upon the blade of grass; in the other, gravitation acting in like manner, but at vast distances, gives the mighty rotundity to the rolling waters of the ocean.

Capillary attraction is a species of cohesion; it takes place only between solids and liquids. It is this which holds the moisture on the surface of a wet body, and which prevents the water from running instantly out of a wet cloth or sponge. By touching the lower extremity of a lump of sugar to the surface of water in a vessel, capillary attraction will cause the water to rise among its granules and moisten the whole lump. It may be very distinctly shown by placing the end of a fine glass tube into water; the water will rise in it above the level of the surrounding surface. If the bore of the tube be the twelfth of an inch in diameter, (*a*, fig. 3,) it will rise a

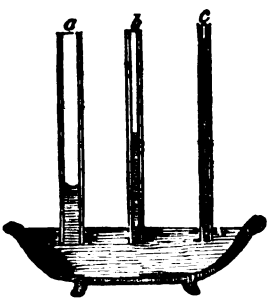


Fig. 3.

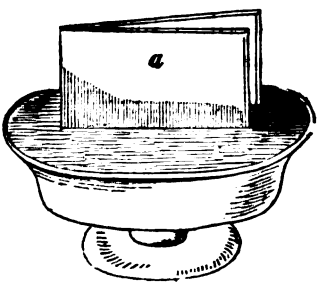


Fig. 4.

quarter of an inch; if but the twenty-fifth of an inch in bore, as *b*, it will rise half an inch; but if only a fiftieth of an inch, the water will rise an inch. This ascent of the liquid is caused by the attraction of the inner surface of the tube, until the weight of the column becomes equal to the force of the attraction. Capillary attraction may be also exhibited by two small plates of glass, placed with their edges in water in contact on one side, and a little open at the other side, as in fig. 4. As the faces of the plates approach each other, the water rises higher, forming the curve *a*.

Capillary attraction performs many important offices in nature. The moisture of the soil depends greatly upon its action. If the soil is composed of coarse sand or gravel, the interstices are large,

Digitized by Google

and like the larger glass tube, will not retain the rain which falls upon it. Such soils are, therefore, easily worked in wet weather, but become too dry in seasons of drouth. But when the texture is finer, and especially if a due proportion of clay be mixed with the and, the interstices become exceedingly small, and retain a full sufficiency of moisture. If, however, there is too much clay, the soil becomes close and compact, and the water cannot enter until it is broken up or pulverized. It is for this reason that sub-soil plowing becomes so eminently beneficial, by deepening the mellow portion, and thus affording a larger reservoir, which acts like a sponge in holding the excess of falling rains, till wanted in the dry season. For the same reason a well cultivated soil is found to preserve its moisture much better during the heat of summer, than a hardened and neglected surface.

CENTRE OF GRAVITY.

The *centre of gravity* is that point in every hard substance or body, on every side of which the different parts exactly balance each other. If the body be a globe or round ball, the centre of gravity will be exactly at the centre of the globe; if it be a rod of equal size, it will be at the middle of the rod. If a stone or any other substance rest on a point directly under the centre of gravity, it will remain balanced on this point; but if the point be not under the centre of gravity, the stone will fall towards the heaviest side.

Every farmer who erects a wall or building; every teamster who drives a heavy load, or even he who only carries a heavy weight upon his shoulder, may learn something useful by understanding the laws of gravity.

If any body, of whatever shape, be suspended by a hook or loop at its top, it will necessarily hang so that the centre of gravity shall be directly under the hook. In this way this point in any substance, no matter how irregular its shape may be, is ascertained. Suppose, for instance, we have the irregular plate or board shown in the annexed figure, (fig. 5,) first hang it by the hook *a*, and the centre of gravity will be somewhere in the dotted line *a b*. Then hang it by the hook *c*, and it will be somewhere in the line *c d*. Now the point *e*, where they cross each other, is the only point in both, consequently this is the

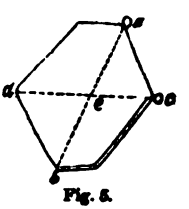


Fig. 5.

Digitized by Google

centre sought. If the mass or body, instead of being flat like a board, be shapeless like a stone or lump of chalk, holes bored from different suspending points directly downwards, will all cross each other exactly at the centre of gravity.

An imaginary line from the centre of gravity perpendicularly downwards, to where the body rests, is called the *line of direction.*

Now, in any solid body whatever, whether it be a wall, a stack of grain, or a loaded wagon, the line of direction must fall within the base or part resting upon the ground, or it will immediately be thrown over by its own weight. A heavily and evenly loaded wagon on a level road will be perfectly safe, because the line of direction falls equally between the wheels, as shown in Fig. 6, by the dotted line, *c* being the centre. But if it pass a steep side-hill road, throwing the line of direction outside the wheels, as in Fig. 7, it must be instantly overturned. If, however, instead of the high load represented in the figure, it be some very heavy material, as brick or sand, so as not to be higher than the dark part of the figure, the centre of gravity will be much lower down or at *b*, and thus the line falling within the wheels, the load will be safe from danger, unless the upper wheel pass over a stone, or the lower wheel sink into a rut. The centre of gravity of a large load may be nearly ascertained by measuring with a rod; and it may sometimes happen, that by measuring the sideling slope of a road, all of which may be done in a few minutes, a teamster may save himself from a comfortless upsetting and perhaps heavy loss. Again, a load may be temporarily placed so much towards one side, while passing a sideling road, as to throw the line of direction considerably more up hill than usual, and save the load, which may be adjusted again as soon as the dangerous point is passed. This principle also shows the reason why it is safer to place only light bundles of merchandize on the top of a stage coach, while all heavier articles are down near the wheels. When it becomes necessary to build very large loads of hay, straw, wool, or other light substances, the "reach" or the long connecting-bar of the wagon must be made longer, so as to increase the length of the load. For, by doubling the length, two tons may be piled upon the wagon with

Fig 6.

Fig 7.

Digitized by Google

as much security from oversetting, as one ton only, on a short wagon.

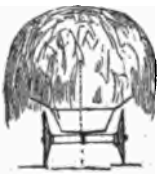


Fig. 8.

Fig. 9.

Where, however, a high load cannot be avoided, great care must be taken to have it evenly placed. If for instance, the load of hay represented by Fig. 8, be skilfully built, the line of direction will fall equally distant within each wheel. But a slight misplacement, as in Fig. 9, will so alter this line as to render it dangerous to drive except on a very even road.

Thus, every one who drives a wagon, should be enough of a philosopher to know how to arrange the load he carries. It is true, that experience and good judgment alone will be sufficient in many cases; but every person can hardly fail to judge better, with the reasons clearly, accurately, distinctly, before his eyes, than by indistinct conjecture and random guessing.

It is familiar to every one, that a body resting upon a broad base, is more difficult to overset than when the base is narrow. For instance, the square block, Fig. 10, is less easily thrown over, than the tall and narrow block of equal weight, Fig. 11. Because, in turning the square block over its lower edge, the centre of gravity must be lifted up considerably, in the curve shown by the dotted line; but with the tall narrow block, this curve being almost on a level, very little lifting is required. Hence the reason that a high load on a wagon is so much more easily overturned than a low one.

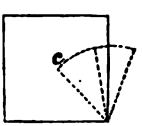


Fig. 10.

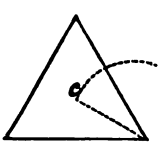


Fig. 12.

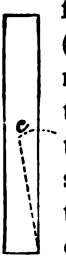


Fig. 11.

Of all forms, a pyramid stands the most firmly on its base. The centre of gravity, *c*, (Fig. 12,) being so near the broad bottom, it must be elevated in a very steep curve to throw the line of direction beyond the base. For this reason a stone wall, or the dam for a stream, will stand better when broad at bottom and tapering to a narrow top than if of equal thickness throughout.

When a globe or round ball is placed upon a smooth floor, it rests on a single point. If the floor be *level*, the line of direction will fall exactly at this resting point, Fig. 13. To

Digitized by Google

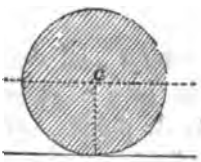


FIG. 13.

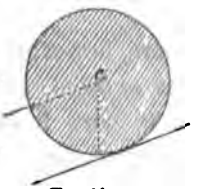


FIG. 14.

move the ball, the centre will move precisely on a level, without being raised at all. This is the reason that a ball, a cylinder, or a wheel, is rolled forward so much more easily than any flat sided or irregular body. In all these cases, the line of direction, although constantly changing its place, still continues to fall on the very point on which the round body rests.

But if the level floor is exchanged for a slope or inclined plane, Fig. 14, the line of direction no longer falls at the touching point, but on the side from it downwards; the ball will therefore by its mere weight, commence rolling and continue to do so till it reaches the end of the slope.

Wheel-carriages owe their comparative ease of draught to the fact that the centre of gravity in the load, is moved forward by the rolling of the wheels, on a level, or parallel with the surface of the road, just in the same way that the round ball rolls so easily. Each wheel supporting its part of the load at the hub, the same rule applies to each, as to a ball or cylinder alone. Hence, on a level road, the line of direction falls precisely where the wheels rest on the ground, but if the road ascend or descend, it falls elsewhere; hence the reason that it will run by its own weight down a slope.

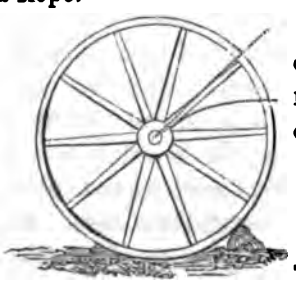


FIG. 15.

FIG. 16.

Whenever a stone or other obstruction occurs in a road, it becomes requisite to raise the centre of gravity by the force of the team so as to throw the wheel over it, as shown by Fig. 15. One of the reasons thus becomes very plain why a large wheel will run more easily on a rough road than a smaller one, the larger one mounting any stone or obstruction without lifting the load so much out of a level, as shown by the dotted lines in the annexed figures. (Figs. 15 and 16.) Another reason is, the large wheel does not sink into the smaller cavities in the road.

Digitized by Google

A self-supporting fruit-ladder, (Fig. 17,) (the centre of gravity when in use being at or near the top,) must have its legs more widely spread to be secure from falling, than if the centre were lower down. Hence such a position as in Fig. 18, would be unsafe.

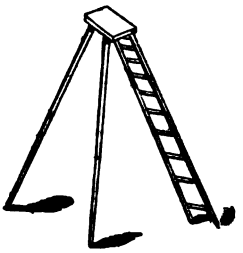


Fig. 17.

The support of the human body in standing and walking, exhibits some interesting examples in relation to this subject. A child cannot learn to walk till he acquires skill enough to keep his feet always in the line of direction. When he fails to do this, he topples over, towards the side that the line falls outside his feet. A man standing with his heels touching the wash-board of a room, cannot possibly stoop over without falling; because when he bends the line of direction falls forward of his toes, the wall against which he stands preventing throwing his body backwards to preserve the balance.

Fig. 18.

In walking, the centre rises and falls slightly at each step, as shown by the waved line in Fig. 19. If it were not for the bending of the knee-joints this exercise would be much more laborious, as it would then become needful to throw the centre into an upward curve at every step. For this reason, a wooden leg is more imperfect than the natural one, Fig. 20. Hence the reason walking on crutches is laborious and fatiguing.

Fig. 19.

Fig. 20.

When a load is carried on the shoulder, it should be so placed that the line of direction may pass directly through the shoulder or back down to the feet, Fig. 21. An inexperienced person will sometimes place a bag of grain as shown in Fig. 22. The line falling outside his feet, he is compelled to draw downwards with great force on the other end of the bag. A man who carries a heavy pole on his shoulder should see that the centre is

Fig. 21.

Fig. 22.

Digitized by Google

directly over his shoulder, otherwise he will be compelled to bear down upon the lighter end, and thus add in an equal degree to the weight upon his shoulder.

If an elliptical or oval body, Fig. 23, rest upon its side *a*, rolling it in either direction elevates the centre, because it is nearest the side on which the body rests. If when raised, it be suffered to fall, its momentum carries it beyond the point of rest, and thus it continues rocking until the force is spent. The course of the centre during these motions, is shown by the curved dotted line.

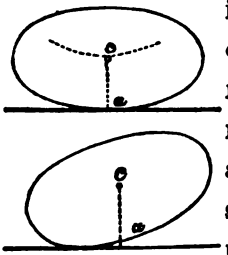


FIG. 23.

If it be placed upon end, as in Fig. 24, then any motion towards either side brings the centre of gravity nearer the touching point, that is, causes it to descend, and the body consequently falls over on its side. This may be easily illustrated with an egg.

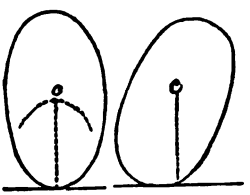


FIG. 24.

The rockers of chairs, cradles, and cribs, are formed on the principle just explained. If so made that the centre of gravity of the chair or cradle is nearer the middle of the rocker than to the ends, the rocking motion will take place; and when the distance from the centre of gravity to the ends of the rockers is but little greater than the distance to the middle, as in Fig. 25, the motion will be slow and gentle; but if this difference be greater, as in Fig. 26, it will be rapid. When the centre is high, the rockers must have less curvature than where it is low or near the floor. If the centre of gravity be nearer the ends than to the middle, the chair will immediately be overturned. This principle should be well understood in the construction of all instruments which move by rocking.

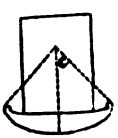


FIG. 25.

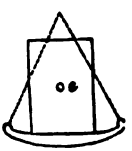


FIG. 26.

Digitized by Google

SIMPLE MACHINES.

The moving forces which are applied to various useful purposes, usually require some change in velocity, direction, or mode of acting, before they accomplish the desired end. For example, a running stream of water has a motion in one direction only; by the use of machinery we change this to an alternating motion, as in the saw of the saw-mill; or to a rotatory or whirling motion as in the stones of a grist-mill. The direct or straight-forward force of a yoke of oxen, is made by the use of the plow, to produce a side motion to the sod as well as to turn it through half a circle. The threshing machine converts the slowly acting pace of horses to the swift hum of the spiked cylinder.

Any instrument used for thus changing or modifying motion, is called *a machine*, whether it be simple or complex in its structure. Thus, even a *crowbar*, used in lifting stones from the earth, by diminishing the motion given by the hand and increasing its power, may be strictly termed a machine; while a *harrow*, which neither alters the course nor changes the velocity of the force applied, may with more propriety be regarded as simply an implement or tool. In common language, however, these distinctions are not accurately observed, and a machine is usually considered to be any instrument consisting of different moving parts.

All machines, however complex, may be resolved into two simple parts, or simple machines. These are,

1. The Lever:
2. The Inclined Plane.

The *wheel and axle*, and the *pulley*, are modified applications of the lever and the *wedge* and the *screw*, of the inclined plane, as will be shown on the following pages. These six, are usually termed the *mechanical powers*. As they really do not possess any power in themselves, the term "simple machines" may be regarded as most correct.

The Law of Virtual Velocities.

Before proceeding to the simple machines, it may be well to explain a very important truth, which may be considered as lying at the foundation of all mechanical philosophy, and which renders

Digitized by Google

plain and simple many things which would otherwise seem strange or contradictory. This is, that the force required to lift any given body, is always in proportion to the weight of that body, and also to the height to be raised. For instance, it requires twice the force to raise two pounds as to raise one pound, three times the force to raise three pounds, and so forth. Also, twice as great a force is needed to elevate any weight two feet as one foot, or three times as great for three feet, and so on. Again, combining these together four times as great a force is required to raise two pounds to a height of two feet, as to raise one pound only one foot; eight times as great for four feet, and so on. This holds true, no matter by what kind of machinery it is accomplished. Now, this may all seem very simple, but it serves to explain the real power possessed by all machines.

Take another example. Suppose that one wishes to raise a weight of 1,000 pounds to a height of one foot. If his strength is only equal to 100 pounds, the weight would be ten times too heavy for him. He might, therefore, divide it into ten equal parts of 100 pounds each. Raising each part separately the required height of one foot, would be the same as raising one of them ten feet high. The weight is lessened ten times, but the distance is increased ten times. But there are some objects, as for example, blocks of stone or sticks of timber, which cannot well be divided into parts in actual practice. He therefore resorts to a machine or mechanical power, by which the same result is accomplished by raising the whole weight in one mass, with his single strength; but in this case as well as the other, the moving force which he applies, must pass through ten times the space of the weight. We therefore, arrive at the general rule, that the distance moved by the weight is as much less than that moved by the power, as the power is less than the weight. This rule is termed by some writers, the "*rule of virtual velocities*;" *virtual*, meaning not apparent or actual, but according to the real effect; because the increase in the velocity of the power makes up for increase in the size of weight. This rule will be better understood after considering its application to the different simple machines.

Digitized by Google

The Lever.

The simplest of all machines is the *lever*. It consists of a rod or

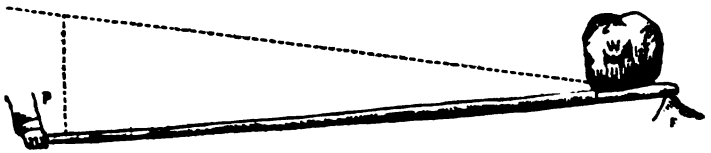


Fig. 27.

bar, one end resting upon a prop or *fulcrum* F, (Fig. 27,) near which is the weight W, moved by the hand at P. The stone may weigh 1,000 pounds; yet if it is ten times as near the fulcrum as the man's hand is, a force of 100 pounds will lift it. But it will be moved only a tenth part as high as the hand has been moved, as shown by the dotted lines. By placing the stone still nearer the fulcrum, still less will be the power required to raise it, but then the distance elevated would be also still less. By sufficiently increasing the disproportion between the two parts of the lever, the strength of a child merely might be made to move more than four horses could draw.

These performances of the lever often excite astonishment at what appears to be out of the common course of things. Yet, when examined by the principles of mechanics, instead of appearing matters of astonishment, they are found to be only the natural and necessary results of the laws of force. In the case of the lever just described, it is often incorrectly supposed that the power itself sustains the weight. But this is not the case; nearly the whole of it rests upon the fulcrum. We often see proofs of this error in common practice, where fulcrums or props, entirely insufficient to uphold the enormous weight to be raised, are attempted to be used. If the weight, for instance be ten times as near the fulcrum as to the power, then nine-tenths of the weight rests upon the fulcrum, and the remaining tenth only is sustained by the lifting power. The lever only allows the power to expend itself through a longer distance, and thus by concentrating itself at the weight, to elevate the latter through the shorter distance, according to the rule of virtual velocities already explained.

The fulcrum may be placed between the weight and the power,

Digitized by Google

as in Fig. 28, or the power may be placed between the fulcrum and the weight, as in Fig. 29, the same principle of virtual velocities applying in all cases.

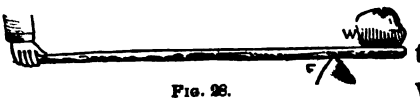


FIG. 28.

Where the fulcrum is between the power and the weight, as in Fig. 28, it is called a *lever of the first kind.* Where the weight is between the fulcrum and the power, as in Fig. 27, it constitutes a *lever of the second kind.*

FIG. 29.

Where the power is between the fulcrum and the weight, as in Fig. 29, it is termed a *lever of the third kind.*

1. Many examples occur in practice of levers of the first kind. A crowbar, used to raise stones from the earth, is an instance of this sort; so is a handspike of any kind used in the same way. A hammer for drawing a nail operates as a lever of the first kind, the heel being the fulcrum, the nail the weight, and the hand the power; the distance through which the handle passes being several times greater than that of the claws, the force exerted on the nail is increased in like proportion. A pair of scissors consists of two levers, the rivet being the fulcrum; and in using them, as every one has observed, a greater cutting force is exerted near the rivets than towards the points. This is owing to the power being expended through a greater distance near the points, according to the rule already explained. Pincers, nippers, and other similar instruments, are double levers operating in the same way.

A common steel-yard is a lever of the first kind, the sliding weight becoming gradually more effective as it is moved further from the fulcrum or hook supporting the instrument. The brake or handle of a pump is a lever of this class, the pump-rod and piston being the weight.

2. Levers of the second kind are less numerous, but not uncommon. A handspike used for rolling a log is an example. A wheelbarrow is a lever of the second kind, the fulcrum being the point where the wheel rests on the ground, the weight the centre of gravity of the load. Hence, less exertion of strength is required in the arm, when the load is placed near the wheel; except where the

Digitized by Google

ground is soft or muddy, when it is found advantageous to place the load so that the arm shall sustain a considerable portion of it, to prevent the wheel sinking into the soil. A two-wheeled cart is a similar example, and for the same reason, when the ground is soft, the load should be placed forward towards the horse or oxen; on the other hand, on a smooth and hard, or on a plank road, the load should be more nearly balanced. An observance of this rule would often save a great deal of needless waste of strength.

3. In a lever of the third kind, the weight being further from the fulcrum than the power, it is only used where great power is of secondary importance when compared with rapidity and despatch. A hand-hoe is of this class, the left hand acting as the fulcrum, the right hand as the power, and the resistance overcome by the blade of the hoe, as the weight. A hand-rake is similar, as well as a fork used for pitching hay. Tongs are double levers of this kind, as also the shears used in shearing sheep. The limbs of animals, generally, are levers of the third kind. The joint of the bone is the fulcrum; the strong muscle or tendon attached to the bone near the joint is the power; and the weight of the limb, with whatever resistance it overcomes, is the weight. A great advantage results from this contrivance, because a slight contraction of the muscle gives a swift motion to the limb, so important in walking and running, and in the use of the arms.

The power of any lever is easily calculated by measuring the length of its two arms, that is, the two parts into which it is divided by the weight, fulcrum, and power. In a lever of the first kind, if the weight and power be equally distant from the fulcrum, they will move through equal distances, and nothing will be gained, that is, a power of 100 pounds will lift a weight of 100 pounds only. If the power be twice as far as the weight, its force will be doubled; if three times, it will be tripled, and so forth. In a lever of the second kind, if the weight be equidistant between the fulcrum and power, the power will move through twice the distance of the

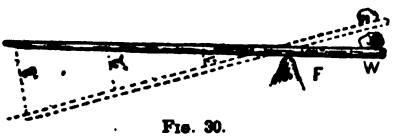


Fig. 30.

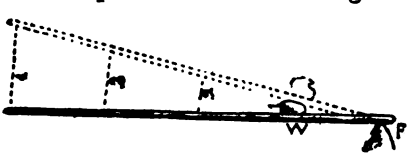


Fig. 31.

Digitized by Google

weight, and its power will therefore be doubled; if twice as far it will be tripled, and so on, as shown in the annexed figures. The same mode of reasoning will show precisely to what extent the force is diminished in levers of the third kind.

These rules will show in what manner a load borne on a pole is to be placed between two persons carrying it. If equidistant between them, each will sustain a like portion. If the load be twice as near to one as to the other, the shorter end will receive double the weight of the longer. For the same reason, when three horses are worked abreast, the two horses placed together should have only half the length of arm of the main whipple-tree as the single horse, Fig. 32. The farmer who has a team of two horses unlike in strength, may thus easily know how to adjust the arms of the whipple-tree, so as to correspond with the strength of each. If, for instance, one of the horses possesses a strength as much greater than the other as four is to three, then the weaker horse should be attached to the arm of the whipple-tree made as much longer than the other arm as four is to three.

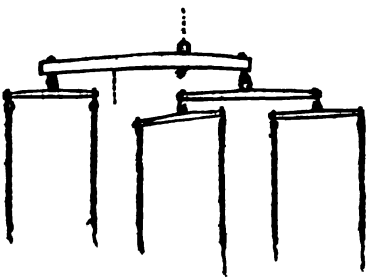


FIG. 32.

In all the preceding estimates, the influence of the weight of the lever has not been taken into consideration. In a lever of the first kind, if the thickness of the two arms are so adjusted that it will remain balanced on the fulcrum, its weight will have no other effect than to increase the pressure on the fulcrum. But if it be of equal size throughout, its longer arm, being the heaviest, will add to its power. The amount thus added will be equal to the excess in the weight of this arm, applied so far along as the centre of gravity of this excess. If, for example, a piece of scantling twelve feet long, *a b*, Fig. 33, be used as a lever to lift the corner of a building, then the two portions, *a c*, *c d*, will mutually balance each other. If these be each a foot in length, the weight of ten

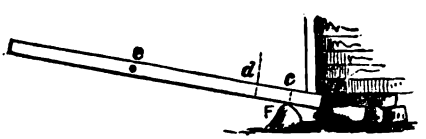


FIG. 33.

Digitized by Google

feet will be left to bear down the lever. The centre of gravity of this portion will be at *c*, six feet from the fulcrum, and it will consequently exert a force under the building equal to six times its own weight. If the scantling weigh five pounds to the foot, or fifty pounds for the excess, this force will be equal to three hundred pounds.

In the lever of the second kind, its weight operates *against* the moving-power. If it be of equal size throughout, this will be equal to just one-half the weight of the lever, the other half being supported by the fulcrum.

With the lever of the third kind, the rule applied to the first must be exactly reversed.

A great power may be attained without the inconvenience of resorting to a very long lever, by means of a *combination of levers*. In Fig. 34, the small weight P, acting as a moving power, exerts a three-fold force on the next lever; this in its turn acts in the same degree on the third, which again increases the power three times. Consequently, the moving power P acts upon the weight W in a twenty-seven-fold degree; the former passing through a space twenty-seven times as great as the latter.

A combination of levers like this is employed in self-regulating stoves. It is however used to multiply instead of to diminish motion. The expansion of a metallic rod by heat the hundredth of an inch acts on a set of iron levers and the motion is increased by the time it reaches the draught-valve to about one hundred times.

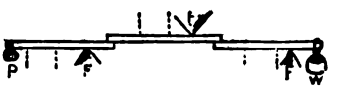


Fig. 34.

A more compact arrangement of compound levers is shown in Fig. 34, *a*, where the power P acts on the lever A, exerting a force on the lever B five times as great as the power. B acts on the lever C with a force increased three times, and this again on the weight W, with a four-fold force. Multiplying 5, 3, and 4 together, the product is 60; hence a force of one pound at P will support 60 lbs. at W.

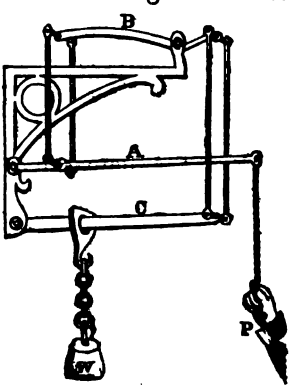


Fig. 34, *a*.

By graduating (or making

Digitized by Google

into notches) the lever C, so that the distance is measured as the weight is moved along it, a compact and powerful steel-yard for weighing is formed.

WHEEL AND AXLE.

In treating of the lever, it was shown to be capable of exerting a force through a small distance only. Hence, if a heavy body were required to be elevated to any considerable height, it would be necessary to accomplish it by a succession of efforts. This inconvenience is removed by a constant and unremitted action of the lever, in the form of the *wheel and axle.*

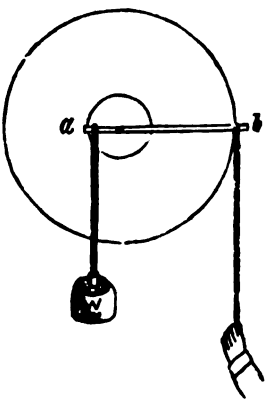


FIG. 35.

Let the weight, *w*, Fig. 35, be suspended by a cord from the end of the lever *a b*, and a wheel attached to the lever so that this cord may wind upon it as the weight is elevated. Then, let the power be applied at the other end by means of a cord, and a larger wheel be attached so that this cord too may wind upon the larger wheel. These two wheels (fastened together so as to form one,) as they are made to revolve on their axis, will now constitute in a manner a succession of levers, acting through an indefinite distance according to the length of the cords. The levers here successively acting are of the "first kind," and the axis of the wheels is the fulcrum. This arrangement constitutes in substance *the wheel and axle;* and its power, like that of the simple lever, depends on the comparative velocity of the weight and of the moving force. If, for example, the larger wheel is four times the circumference of the smaller, a force of one hundred pounds applied to the outer cord, will raise a weight of four hundred pounds.

The thickness of the rope has not been taken into consideration. This is very small when compared with the diameter of the outer wheel, but often considerable when compared with that of the inner. To be strictly accurate, therefore, the force must be consi-

Digitized by Google

dered as acting at the centre of the rope; hence the diameter of the rope must be added to the diameter of the wheel.

There are various forms of the wheel and axle. In the common windlass, motion is given to the axle by means of a winch, which is a lever like the handle of a grind-stone. The windlass used in digging wells, has usually four projecting levers or arms. The wheel used in steering a vessel is furnished with pins in the circumference, to which the hand is applied in turning it. In the capstan (for weighing anchor) the axis is vertical, and horizontal levers are applied around it, so that several men may work at it at once. The power of all these forms is easily calculated by the rule of virtual velocities, that is, that the velocity with which the power moves is as many times greater than the velocity of the weight, as the weight exceeds the power. A simple and convenient rule for computing in numbers the power of wheel work, is the following: Multiply all the numbers together which express either the circumferences or diameters of the large wheels; and then multiply together all the numbers which express the diameters of the smaller wheels or pinions; divide the greater number by the lesser, and the quotient will be the power sought.

Where great power is required, several wheels and axles may be combined in a manner resembling that of the compound system of levers already explained. In this case the axis of one wheel acts on the circumference of the next, producing a continued slower motion, and increasing the power in a corresponding degree. The wheels are made thus to act by means of cogs or teeth, or of bands. In ordinary practice, however, combined wheels are made use of to multiply motion, instead of to diminish it, familiar instances of which occur in the grist-mill and threshing machine.

In connecting a system of wheels, the cord or strap may be used where great force is not required, the friction round the circumference being sufficient to prevent slipping. Where the force is great, the necessary tension or tightness of the cord produces too great a friction at the axle. In such cases, cogs or teeth must be resorted to.

The term *teeth* is usually applied when they are formed of the same piece as the wheel, as in the case of cast iron wheels; *cogs* are teeth formed separately and inserted into the wheel, as with

Digitized by Google

wooden wheels. *Pinions* are the small wheels, or more properly teeth set on axles.

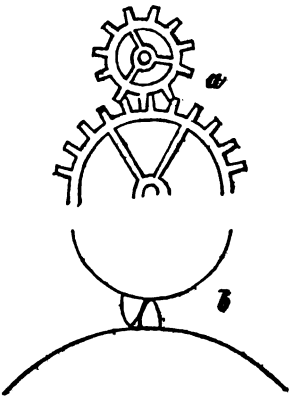


FIG. 35.

The form of the teeth has a great influence on the amount of friction among wheelwork. Badly formed teeth are represented at *a*, in the annexed figure, consisting of square projecting pins. When these teeth first come into contact with each other, they act *obliquely* together, and thus a part of their force is lost; and they continue scraping together with a large amount of friction, so long as they remain in contact. These effects are avoided by giving to them the curved form represented by *b*. Here, instead of pressing each other obliquely, they act at right angles, as shown by the dotted lines; and instead of scraping, they *roll over* each other with ease. These curves are ascertained by mathematical calculation, which cannot be here given; it may be enough to state that they should be so formed that the points in contact shall always work at right angles to each other.

Wheelwork is often defective in consequence of the relative number of teeth, working together, not being such as to equalize the wear of all alike. If the number of teeth on a wheel is divided without a remainder by the number of the pinion, then the same teeth will repeatedly engage each other, and they will often wear unevenly. The number should be so arranged, that every tooth of the pinion may work in succession into the teeth of the wheel. This is best effected by first taking a number for the wheel that will be evenly divided by the number on the pinion, and then adding *one more* tooth to the wheel. This will effect a continual change, so that no two shall be engaged with each other twice until all the rest have been gone through with. This odd tooth is called the *hunting cog*.

Digitized by Google

The Pulley.

Let a cord, fixed at one end, pass round a moveable grooved wheel, and be grasped by the hand at the other end; then, in lifting any weight attached to the wheel, by drawing up the cord, the hand will move with twice the velocity of the weight. It will therefore exert double the degree of force. This operates precisely as a succession of levers of the second kind, the fixed cord being the fulcrum, and the cord drawn up by the hand, the power. It thus constitutes one of the simplest kinds of the pulley. Fig. 36.

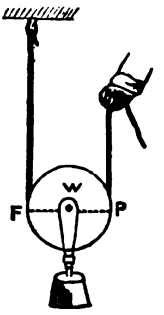


Fig. 36

The wheel is called a *sheave;* the term *pulley* is applied to the block and sheave; and a combination of sheaves, blocks and ropes, is called a *tackle.*

There are various combinations of single pulleys for increasing power, the most common of which and least liable to become deranged by the cord being thrown off the wheels is shown in Fig. 37. In this, and in all similarly constructed pulleys, the weight is as many times greater than the power, as the number of cords which support the lower block. If there be six cords, as in the figure, the weight will be six times the power.

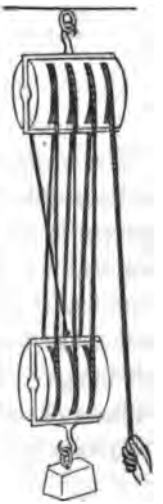


Fig. 37.

Where a cord is passed over a single fixed wheel, as in Fig. 38, or over two or more wheels, as in Fig. 39, no power is gained, the moving force being the same in velocity as the weight. Such pulleys are sometimes, however, of use, by altering the *direction* of the force. In some of the western states the latter is applied with advantage to unloading or pitching hay by means of a horse power, saving much time and labor, as shown in Fig. 39. The head of the fork, (Fig. 40,) is about 28 inches long and is fitted with steel prongs 20 inches long. The rope attached at *a*, passes over the pulley above, by which the fork, after being thrust into the hay, is lifted by the strength of the horse working just without the barn door. It is kept level by means of the rope *b*, until the fork is high enough to unload, when this rope

Fig. 38.

Digitized by Google

is slackened, and the hay deposited. The man on the mow can give any direction to the hay he pleases, while it remains suspended. The horse is backed, and the operation repeated. The arrangement is cheap, and with it six tons have been pitched 20 feet high in an hour.

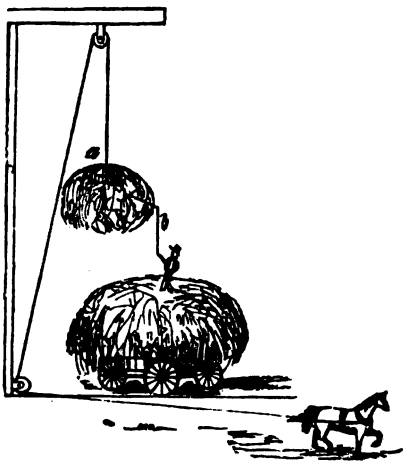


FIG. 39.

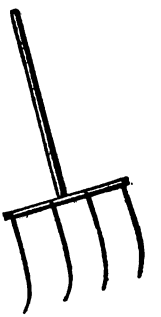


FIG. 40.

The usefulness of the pulley depends mainly upon its lightness and portable form, and the facility with which it may be made to operate in almost any situation. Hence it is much used in building, and is extensively applied in the rigging of ships. In the computation of its power, there is a large drawback, not taken into account in the preceding calculation, which materially lessens its advantage. This is the friction of the wheels and blocks and the stiffness of the cordage, which are often so great that two-thirds of the power is lost.

THE INCLINED PLANE.

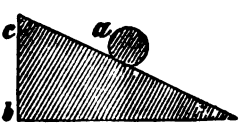


FIG. 41.

The *Inclined plane* or slope, possesses a power which is estimated by the proportion which its length bears to the height. If, for example, the plane be twice as long as the perpendicular height, then in rolling the body *a* up the inclined plane, (Fig. 41,) it will move through twice the distance required to lift it directly from *b* to *c*. Therefore only one half the strength else required need be exerted

Digitized by Google

for this purpose. The same reasoning will apply to any other proportion between the height and length; that is, the more gradual or less steep the slope becomes the greater will be the advantage gained. A familiar example occurs in lifting a loaded barrel into a wagon,—the longer the plank used for rolling it upon, the less is the exertion needed.

A body in rolling freely down an inclined plane, acquires the same velocity that it would attain if dropped perpendicularly from a height equal to the perpendicular height of the plane. Thus, if an inclined plane on a plank road be 100 yards long and 16 feet high, a freely running wagon left to descend of its own accord, will move 32 feet per second by the time it reaches the bottom, that being the velocity of a stone falling sixteen feet. Or, a rail car on an inclined plane one hundred and forty-five feet high, will attain a speed of ninety-six feet per second, or more than sixty-five miles an hour, at the foot of the plane, which is equal to the velocity of a stone falling three seconds or one hundred and forty-five feet.

All roads not perfectly level may be regarded as inclined planes. By the application of the preceding rule, we may discover precisely how much strength is lost in drawing heavy wagons up hill. If the load and wagon weigh a ton, and the road rise one foot in height to every five feet of distance, then the increased strength required to draw the load will be one-fifth of its weight, or equal to four hundred pounds. If it rise only one foot in twenty, then the increase in power needed to ascend this plane, will be only one hundred pounds. The great importance of preserving as near as practicable a perfect level, is very obvious.

There are many roads made in this country, rising over and descending hills, which might be made nearly level by deviating a little to the right or to the left. Suppose, for example, that a road

Fig. 42.

be required to connect the two points *a* and *b*, Fig. 42, three miles apart, but separated by a lofty hill midway between them, and one mile in diameter. Passing half a mile on either side would entirely avoid the hill, and the road thus curved would be only one

Digitized by Google

hundred and forty-eight yards or one-twelfth of a mile longer. The same steep hill is ascended perhaps fifty to five hundred times a year by a hundred different farmers, expending an amount of strength, in the aggregate, sufficient to elevate ten thousand tons annually to this height, as a calculation will at once show,—more than enough for all the increased expense of making the road level.

It is interesting and important to examine how much further it is expedient to carry a road through a circuitous level course than over a hill. To ascertain this point, we must take into view the resistance occasioned by the rough surface or soft material of the road. Roads vary greatly in this particular, but the following may be considered as about a fair average:—In drawing a ton weight (including wagon,) on freely running wheels, on a perfect level, the strength exerted will be found about equal to the following:

On a hard smooth plank road, ...	40	pounds.
On a good McAdam road,.....	60	"
On a common good hard road, ...	100	"
On a soft road, about.....	200	"

Now let us compare this resistance to the resistance of drawing up hill. First, for the plank road—forty pounds is one fiftieth of a ton; therefore a rise of one foot in fifty of length will increase the draught equal to the resistance of the road. Hence the road might be increased fifty feet in length to avoid an ascent of one foot; or at the same rate, it might be increased a mile in length to avoid an ascent of one hundred and five feet. But in this estimate, the increase in cost of making the longer road is not taken into account. If making and keeping in repair be equal to three hundred dollars yearly per mile,—and one hundred teams pass over it daily, at a cost for travelling of four cents each per mile, being four dollars daily, or twelve hundred dollars per annum,—then the cost of making and repair would be one quarter of the expense of travelling over it. Therefore the mile should be diminished one quarter in length to make these two sources of expense counterbalance each other. Hence a road with this amouut of travel should, with a reference to public accommodation, be made three-fourths of a mile longer to avoid a hill of one hundred and five feet. This estimate applies to loaded teams only. For light carriages, the advantages of the level road would not be so great. One-half to five-

Digitized by Google

eighths of a mile would therefore be a fair estimate for all kinds of travelling taken together.

The following table shows the rise in a mile of road for different ascents :

For a rise of	1	foot in	10,	the road ascends	528	feet per mile.
do	1	do	13,	do	406	do
do	1	do	15,	do	352	do
do	1	do	20,	do	264	do
do	1	do	25,	do	211	do
do	1	do	30,	do	176	do
do	1	do	35,	do	151	do
do	1	do	40,	do	132	do
do	1	do	45,	do	117	do
do	1	do	50,	do	106	do
do	1	do	100,	do	53	do
do	1	do	125,	do	42	do

The same kind of reasoning applied to a common good road, will show that it will be profitable for the public to travel about half that distance to avoid a hill of one hundred and five feet. In this case the whole yearly cost of the road, including interest on the land, and the cost of repairs, would not usually be more than a tenth part of the same cost for plank, or would not exceed thirty dollars.

On railroads, where the resistance is only about one-fifth part of the resistance of plank roads, the disproportion between the draught on a level and up an ascent, becomes many times greater. Thus, if a single engine will move three hundred and fifty tons on a level, then two engines will be required for an ascent of only twenty feet per mile ; four engines for fifty feet per mile ; and six engines for eighty feet per mile.

Such estimates as these merit the attention of the farmer in laying out his own private farm roads. It may be worthy of considerable effort to avoid a hill of ten or twenty feet, which must be passed over an hundred times yearly, with loads of manure, grain, hay, and wood. The greatly increased resistance of soft materials, also, is too rarely taken into account. A few loads of gravel, well applied, would often prevent ten times the labor in plowing

Digitized by Google

through deep ruts, to say nothing of the breaking of harness and wagons by the excessive exertions of the team.

The principles of road-making should be better understood by the community at large. Farmers are deeply interested in good roads. Nearness to market, and facilities for all other kinds of communication, are worth a great deal, often materially affecting the price of land and its products. The difference between travelling ten miles, through deep mud, at two miles per hour with half a load; and travelling ten miles over a fine road, at five miles per hour, with a full load, should not be forgotten.

"In the absence of such facilities," says Gillespie, "the richest productions of nature waste on the spot of their growth. The luxuriant crops of our western prairies are sometimes left to decay on the ground, because there are no rapid and easy means of conveying them to market. The rich mines in the northern part of the State of New-York are comparatively valueless, because the roads among the mountains are so few and so bad, that the expense of the transportation of the metal would exceed its value. So, too, in Spain, it has been known after a succession of abundant harvests, that the wheat has actually been allowed to rot, because it would not repay the cost of carriage." Again, "When the Spanish government required a supply of grain to be transferred from Old Castile to Madrid, 30,000 horses and mules were necessary for the transportation of four hundred and eighty tons of wheat. Upon a broken-stone road of the best sort, *one-hundredth* of that number could easily have done the work." He further adds, in speaking of the improvements in roads made by Marshal Wade in the Scottish Highlands, "His military road is said to have done more for the civilization of the Highlands than the preceding efforts of all the British monarchs. But the later roads under the more scientific direction of Telford, produced a change in the state of the people which is probably unparalleled in the history of any country for the same space of time. Large crops of wheat now cover former wastes; farmers, houses, and herds of cattle are now seen where was previously a desert; estates have increased seven-fold in value and annual returns; and the country has been advanced at least one hundred years."

Digitized by Google

The Wedge.

The wedge is a double inclined plane, the power being applied at the back to urge it forward. It becomes more and more powerful, as it is made more acute; but on account of the enormous amount of friction, its exact power cannot be very accurately estimated. It is nearly always urged by successive blows of a heavy body, the momentum of which imparts to it great force.

All cutting and piercing instruments, as knives, scissors, chisels, pins, needles, and awls, are wedges. The degree of acuteness must be varied according to circumstances; knives, for instance, which act merely by pressure, may be made with a much sharper angle than axes, which strike a severe blow. For cutting very hard substances, as iron, the edge must be formed with a still more obtuse angle.

The utility of the wedge depends on the friction of its surfaces. In driving an iron wedge into a frozen or icy stick of wood, as every chopper has observed, the want of sufficient friction causes it immediately to recoil, unless it be previously heated in the fire. The efficacy of nails depends entirely on the friction against their wedge-like faces.

The Screw.

The screw may be regarded as nothing more than an inclined plane winding round the surface of a cylinder, Fig. 43. This may be easily understood by cutting a piece of paper in such a form that its edge *a b*, Fig. 44, may represent the inclined plane; then beginning at the wider end and wrapping it about the cylindrical piece of wood, *c*, the edge will represent the thread of the screw.

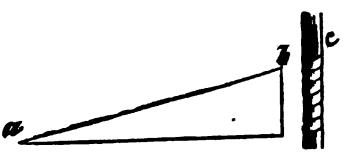


Fig. 44.

Fig. 43.

Although the friction attending the use of the screw is considerable, and without it, it would not retain its place, yet the slope of its inclined thread being so gradual, it possesses great power. This power is multiplied to a still greater degree by the lever which is usually employed to drive it. If, for example, a screw be ten

Digitized by Google

inches in circumference, and its threads half an inch apart, it exerts a force twenty times as great as the moving power. If it be moved by a lever twenty times as long as the diameter of the screw, here is another increase of twenty times in force. Multiplying twenty by twenty gives four hundred, the whole amount gained by this combination, and by which a man applying one hundred pounds in force could exert a pressure equal to twenty tons. About one-third or one-fourth of this should however be deducted for friction.

APPLICATION OF MECHANICAL PRINCIPLES IN THE STRUCTURE OF THE PARTS OF IMPLEMENTS AND MACHINES.

In contriving the more difficult and complex machines, the principles of mechanics must be closely studied, to give every part just that degree of strength required, and to render their operation as perfect as possible. But in making the more common and simple implements of the farmer, mere guess work too often becomes the only guide. Yet it is highly useful to apply scientific knowledge even in the shaping of a hoe-handle or a plow-beam.

The simplest tool, if constantly used, should be formed with a view to the best application of strength. The laborer, who makes with a common hoe, two thousand strokes an hour, should not wield a needless ounce. If any part is heavier than necessary, even to the amount of half an ounce only, he must repeatedly and continually lift this half ounce, so that the whole strength thus spent would be equal, in a day, to twelve hundred and fifty pounds, which ought to be exerted in stirring the soil and destroying weeds. Or, take another instance. A farm-wagon usually weighs nearly half a ton; many of them might be reduced fifty pounds in weight, by proportioning every part exactly to the strength required. How much then should we gain here? Every farmer who drives a wagon with its needless fifty pounds on an average of only five miles a day, draws an unnecessary weight every year equal to the conveyance of a heavy wagon-load to a distance of forty miles.

Now a knowledge of mechanical science, will often enable the farmer, when he selects and buys his implements, to judge correctly whether every part is properly adapted to the required strength. We shall suppose for instance that he intends to purchase a com-

Digitized by Google

mon pitch-fork. He finds them differently formed, although all are made of the best materials. The handles of some are of equal size throughout. Some are smaller near the fork as Fig. 45, and others are larger near the middle, as in Fig. 47. Now, if he understands the principle of the lever, he knows that the right hand placed at *a*, is the fulcrum, where the greatest strength is needed, and therefore the one represented by Fig. 46, is both stronger and lighter than the others. Again, *hoe-handles*, not needing much strength, chiefly require lightness and convenience for grasping. Hence, in selecting from two such as are represented in the annexed figures, the one should be chosen which is lightest near the blade, nearly all the motion being in that direction, the upper end being the *centre* of motion. The right-hand at *a*, acting partly as the fulcrum, the hoe-handle should be slightly enlarged at that place. Fig. 48 represents a well formed handle, Fig. 49, a clumsy one. Rake-handles should be made largest at the middle, or where the right hand presses. Rake-heads should be much larger at the centre, and taper much to the ends, as far less stress occurs there, the two parts operating as two distinct levers, acting from the middle. *Horse-rakes* might be made considerably lighter than they usually are, by observing the same principles. The greatest strength required for *plow-beams*, is at the junction with the mouldboard, and the least, near the forward end, or farthest from the fulcrum or centre of motion.

Fig. 45.

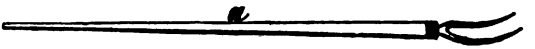


Fig. 46.

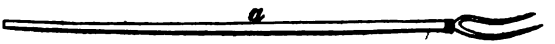


Fig. 47.

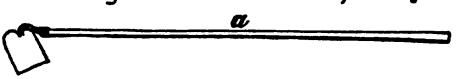


Fig. 48.

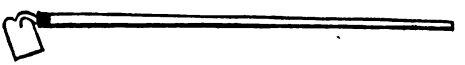


Fig. 49.

Now, it may be that the farmer who has had much experience, may be able to judge of all these things, without a knowledge of the science. But this scientific knowledge would serve to strengthen his experience, and enable him to judge more accurately and understandingly, by showing him the reasons. And in many cases

Digitized by Google

where *new* implements were introduced, he might be enabled to form a good judgment, before all the expense and losses of unsuccessful trials.

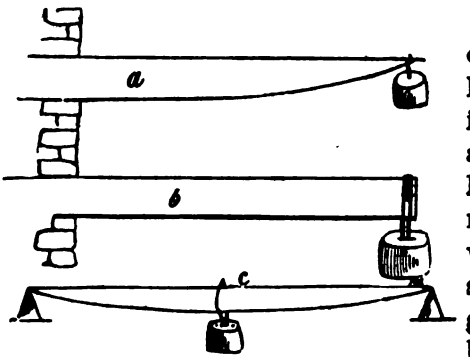


FIG. 50.

In the heavier machines, it is necessary to know the degree of taper in the different parts with accuracy. A thorough knowledge of science is needed to calculate this with precision, but a superficial idea may be given by figures. If a bar of wood, *a*, Fig. 50, is fixed in a wall of masonry, it will possess as much strength to support a weight hung on the end, if it has the form shown in the figure, as if it were of the same size throughout, as *b*. The first is equally strong with the second, and much lighter.* The same form must be given if the bar is supported at the middle, with a weight at each end, or with the weight at the middle, supported at each end, as *c*. This form therefore is a proper one for many parts of implements, as the bars of whipple-trees, the rounds of ladders, string-pieces of bridges, and any cross-beams for supporting weights. One-half of this form, as *a*, is the proper form for rake teeth, wheelbarrow handles, spade handles, &c. On fence posts, the pressure being nearly alike on all parts, they should be nearly in the form of a wedge. Therefore, a post of equal size throughout, contains nearly twice as much timber as is needed for strength only.

The form of these parts must, however, be modified to suit circumstances; as whipple-trees must be large enough at the ends to receive the iron hooks, wagon-tongues for ironing at the end, and spade-handles for the easy grasp of the hand.

The axle-trees of wagons must be made not only strong in the middle, or centre of pressure, but also at the entrance of the hub, because the wheels, when thrown side-wise in a rut, or on a sideling road, operate as levers at that point. The two annexed figures

* The simple style of this essay precludes an explanation of the mode of calculation. The form, where the stick tapers only on one side, is a common parabola; if on all sides a cubic parabola.

Digitized by Google

show the manner in which the axles of carts may be rendered lighter, without lessening the strength, *a* being the common form, and *b* the improved one.

Sometimes several forces act at once on different parts. For example, the spokes of wagon-wheels require strength at the hub for stiffening the wheel; they must be strong in the middle to prevent bending, and

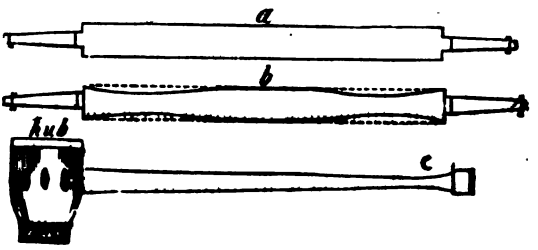


Fig. 51.

large enough at the outer ends, where they are soonest weakened by decay. Hence there should be nearly a uniform taper, slightly larger at the middle, and with an enlargement at the outer end; as *c*, Fig. 51.

A very useful rule in practice, in giving strength to structures is this: the strength of every square beam or stick to support a weight, increases exactly as the width increases, and also exactly as the *square of the depth* increases. For example, a stick of timber eight inches wide and four inches deep or thick, is exactly twice as strong as another only four inches wide and the same depth. But where one is twice as deep as another, the width being equal, it is four times stronger; if three times as deep, it is nine times stronger, and so on. The same rule will show that a board an inch thick and twelve inches wide, will be twelve times as strong when edgewise, as when lying flat. Hence the increase in strength given to whipple-trees, fence-posts, joists, rafters and string-pieces to farm-bridges, by making them narrow and deep.

Again, the strength of a *round* stick increases as the cube of the diameter increases. That is, a round piece of wood, three inches in diameter, is eight times as strong as one an inch and a half in diameter, and twenty-seven times as strong as one an inch in diameter. This rule shows that a fork-handle, an inch and a half in diameter at the middle, is as much stronger than one an inch and a quarter in diameter, as seven is greater than four. Now, this rule would enable the farmer to ascertain this without breaking half a dozen fork-handles in trying the experiment. And it would enable the

Digitized by Google

manufacturer to know, without the labor of trying many experments, that if he makes a fork-handle an inch and a half at the middle, tapering a quarter of an inch towards the ends, it will enable the workman to lift with it nearly twice as much hay, as with one an inch and a quarter only, through its whole length.

Plows.

One great difference between good and bad plows, is in the form of the mouldboard. To understand the best form, it must be observed that the slice is first cut by the forward edge, and then one side is gradually raised until it is turned completely over, or bottom side up. To do this, the mouldboard must combine the two properties of the wedge and the screw.

The position of the furrow-slice, from the time it is first cut, till completely inverted, may be represented by placing a leather strap flat upon a table, and then, while holding one end, to turn over the other, so as to bring that also flat upon the table, as in figure 52. Now, the mouldboard should have just such a shape as will fit the furrow-slice while in the act of turning over, else it will wear unequally, become clogged with soil where the earth rubs slightly, and require greater strength in the team. By examining it will be found that although the strap, (Fig. 52,) twists like a screw, yet all parts will be straight if measured across at right angles, as shown by the dotted lines. Therefore, by applying this principle, the farmer can judge of one important quality in selecting a plow. If, for example, he finds that a straight-edged stick will be flat upon the face, at right angles to the line of draught, as shown by the dotted lines in Fig. 53, the mouldboard will be so far right; but if the straight-edge must be placed in other positions, as in Fig. 54, it is defective.

FIG. 52.

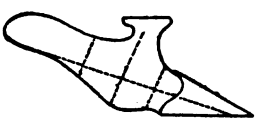


FIG. 53.

FIG. 54.

Another defect in some plows, is too blunt or thick a wedge formed by the share and mouldboard. By the plow represented by

Digitized by Google

Fig. 55, the earth must be thrown from the land-side into the furrow with a velocity about equal to the motion of the team; but by the one shown by Fig. 56, the team moves twice as fast as the earth is thrown by this longer wedge. Consequently, according to the rule of virtual velocities, (already explained,) as applied to the wedge, there is a great gain in power. Care must be taken, however, not to make this wedge too long, else the friction of a greater length of sod may overbalance the advantage.

Fig. 55.

Fig. 56.

An attention to such principles as these, has resulted in an extraordinary improvement within the past thirty years. Plows are made with one-third the former cost, that will do more than twice as much work with the same strength of team, and do it so much better, that larger crops may be reaped from the same land. These advantages are so great, that on all the farms in the United States, there must be a yearly saving of ten millions of dollars in the work of teams, one million in the price of plows, and millions of bushels in the aggregate increase of crops by good tillage. In the two annexed figures, we have a representation of an old and an improved plow. Fig. 57, is such a plow as is now used in some parts of Germany. Fig. 58, is one of the best improved cast plows. Nearly as great a difference exists between the plows used here fifty years ago and at the present time. Some portion of this great improvement may have been effected by persons not familiar with science. But if such persons were enabled to achieve so much, with the few truths which they had themselves laboriously discovered, how much more they might have accom-

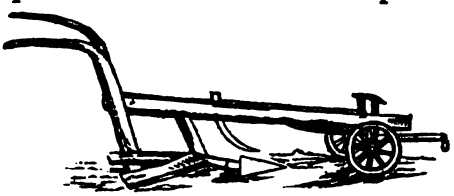


Fig. 57.

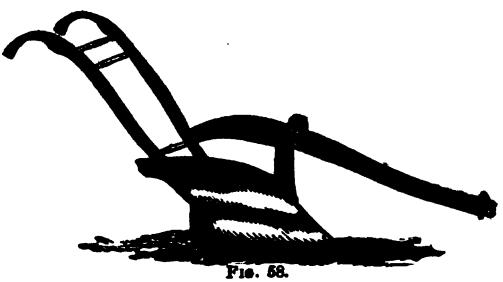


Fig. 58.

Digitized by Google

plished, if they had enjoyed the advantages of all that strong-minded men have discovered during the course of ages, and which is collected together in the form of modern science. How much more, too, would be saved in time and tedious experiments, by applying the principles of science already discovered, than by ascertaining what we wish to know by long repeated trials.

MODELS OF MACHINES.

Serious errors might often be avoided, and sometimes gross impositions prevented, by understanding the difference between the working of a mere model, on a miniature scale, and the working of the full sized machine. It is a common and mistaken opinion that a well constructed model presents a perfect representation of the strength and mode of operation of the machine itself.

When we enlarge the scale of anything, the *strength* of each part is increased as the *square* of the diameter or linear dimensions; but the *weight* is increased as the *cube* of the diameter. Thus, if the linear dimensions of a wooden bar in any machine be doubled, its surface or its cross-section will be increased four times, and its whole bulk or weight eight times. Its real strength (considered with its increased length) would be four times as great, or as the square of its diameter. But if it sustained any weight in a machine, that weight would be increased eight times. Thus the larger the rod is made, the less able it becomes to support the still greater increasing weight. If a model is made one-tenth the real size intended, then its different parts become one hundred times stronger, but it is a thousand times heavier and so are all the weights or parts it has to sustain. All its parts would move ten times faster, and their inertia, and momentum would therefore be ten thousand times greater. For this reason, a model will often work beautifully when made on a small scale; but when enlarged, the parts become so much heavier, and their momentum so vastly greater from the longer sweep of motion, as to fail entirely of success, or to become soon racked to pieces.

This same principle is illustrated in every part of the works of creation. The large species of spiders, spin thicker webs, in comparison with their own diameter, than those spun by the smaller ones. Enlarge a gnat, until its whole weight be equal to that of the eagle, and

Digitized by Google

great as that enlargement would be, its wing will scarcely have attained the thickness of writing paper, and instead of supporting the weight of the animal, would bend down from its own weight. The larger spiders rarely have legs so slender in form as the smaller ones; the form of the Shetland pony is quite different from that of the large cart horse; and the cart horse has a slenderer form than the elephant.

FRICTION.

The subject of friction has been postponed or has been merely alluded to, in treating heretofore of machines, to prevent the confusion of considering too many things at once. As it has often an important influence on the action of machines, it is worthy of careful investigation.

It is familiar to most persons, that when two surfaces slide over each other while pressing together, the minute unevenness or roughness of their surfaces causes some obstruction, and more or less force is required. This resistance is known as *friction*.

The term is also applied to the resistance of one body *rolling over* another. This may be observed in various degrees by rolling an ivory ball successively over a carpet, a smooth floor and a sheet of ice; the same force which would impel it only a few feet on the carpet, would cause it to move as many yards on a bare floor, and a still greater distance on the ice. The two extremes may be seen by the force required to draw a carriage on a deep sandy or loose gravel road, and on a railroad.

If two stiff bristle brushes be pressed with their faces together, they become mutually interlocked, so that it will be quite difficult to give them a sliding motion. This may be considered as an extreme instance of friction, and serves to show its nature. In two pieces of coarse rough sandstone, or of roughly sawed wood, asperities interlock in the same way but less in degree; a diminished force is consequently required in moving the two surfaces against each other. On smoothly planed wood, the friction is still less; and on polished glass, where the unevenness cannot be detected without the aid of a powerful magnifying glass, it is reduced still further in degree.

In order to determine the exact amount of friction between dif-

Digitized by Google

ferent substances, the following simple and ingenious contrivance is adopted. An inclined plane *a b*, Fig 59, is so formed that it may be raised to any desired height by means of the arc of a circle and a screw. Lay a flat surface of the substance we wish to examine upon this inclined plane, and another smaller piece or block of the same substance upon this surface, then raise the plane until it becomes just steep enough for the block to slide down from its weight. Now by measuring the degree of slope we know at once the amount of friction. Suppose, for example, the two surfaces be smoothly planed wood; it will be found that the plane must be elevated about half as high as its length; therefore we know by the properties of the inclined plane, heretofore explained, that it requires a force equal to one-half the weight of the wooden block to slide it over a smooth wooden surface. Some kinds of wood have more friction than others but this is about the average.

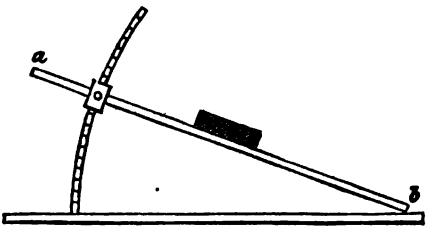


Fig. 59.

From the result of this experiment we may learn that to slide any object of wood across a floor, requires an amount of strength equal to one-half the weight of the object. A heavy box, for instance, weighing two hundred pounds cannot be moved without a force equal to one hundred pounds. It also shows the impropriety of placing a heavy load upon a sled in winter, for crossing a bare wooden bridge, or a dry barn floor, the friction between cast-iron sleigh-shoes and rough sanded plank being nearly equal to one-third of the whole weight.* Hence a load of one ton (including the sled,) would require a draught equal to more than six hundred pounds, which is too much for an ordinary single team. On bare unfrozen ground, the friction would be still greater. On a plank bridge with runners wholly of wood, it would be equal to half the load. All these facts may be readily proved by actually placing the sled on slopes of plank and of earth, and of observing the degree of steepness required for sliding by its own weight.

* On clean hard wood, with polished metallic shoes, the friction would be much less, or a fourth or fifth.

Digitized by Google

In a similar way, we are enabled easily to ascertain the force required to draw a wagon upon any kind of level surface. Suppose, for example, that we wish to determine the precise amount of force for a wagon weighing with its load, one ton, on a plank road. Select some slight descent, where the wagon will barely run with its own weight. Ascertain by a *level*, just what the degree of descent is; then divide the weight of the wagon by the degree of the slope, and we shall have the force sought for. To make this rule plainer by an example; it will be found that a good newly laid track if it possess a descent of only one foot in fifty feet distance, will be sufficient to give motion to an easy-running wagon; therefore we know that the strength required to draw it on a level, will be only one-fiftieth part of a ton, or forty pounds.

The resistance offered to the motion of a wagon by a McAdam road, by a common dry road, and by one with six inches of mud, may be readily determined in the same way by selecting proper slopes for the experiment. If by such trials as these, the farmer ascertains the fact, that a few inches of mud are sufficient to retard his wagon so much, that it will not run of its own weight down a slope of one foot in four, (and few common roads are ever steeper,) then he may know that a force equal to one-fourth the whole weight of his wagon and load, will be required to draw it on a level over a similar road—that is, the enormous force of five hundred pounds will be needed for one ton, of which many wagons will constitute nearly one half. Hence, he cannot fail to see the great importance, for the sake of economy, and humanity to his team, of providing roads, whether public or private, of the hardest and best materials.

Results with the Dynamometer.

Another mode of determining the resistance of roads is by means of the *Dynamometer.** It resembles a *spring-balance*, and one end is fastened to the wagon and the other end to the horses. The force applied shortens the spring, and the degree of strength exerted is shown by the index upon a graduated scale. An inconvenience occurs in the use of this instrument as commonly constructed, in consequence of the quick changes in the resistance, from the

* From two Greek words *dunamis*, power, and *metreo* to measure.

Digitized by Google

roughness or inequalities of the road. These produce a constant vibration in the index. This inconvenience has been removed by attaching one end of the spring to a piston working a cylinder filled with oil. A small hole in the piston suffers the oil to escape from one end to the other as the draught varies, but prevents any sudden change.

Careful experiments have been made with the dynamometer to ascertain accurately the resistance of various kinds of roads. The following are some of the results:

On a new gravel road, a horse will draw eight times as much as the force applied; that is, if he exerts a force equal to one hundred and twenty-five pounds, he will draw half a ton on such a road, including the weight of the wagon, *the road being perfectly level.*

On a common road of sand and gravel, sixteen times as much, or one ton;

On the best hard earth road, twenty-five times as much, or one and a half tons;

On a common broken stone road twenty-five to thirty-six times as much, or one and half to two and a quarter tons.

On the best broken-stone road, fifty to sixty-seven times as much, or three to four tons;

On a common plank road, clean, fifty times as much, or three tons;

On a common plank road, covered thinly with sand or earth, thirty to thirty-five times as much, or about two tons;

On the smoothest oak plank road, seventy to one hundred times as much, or four and a half to six tons;

On a highly finished stone track-way, 170 times as much, or ten and a half tons;

On the best railroad, two hundred and eighty times as much, or seventeen and a half tons.

The firmness of surface given to a broken-stone road by a paved undation, was found to lessen the resistance about one-third.

On a broken-stone road, it was found that a horse could draw only about two-thirds as much when it was moist or dusty as when dry and smooth; and when muddy, not one-half as much. When the mud was thick only about one-quarter as much.

Digitized by Google

The character of the vehicle has an influence on the draught. Thus, a cart, a part of the load of which is supported by the horse, usually requires only about two-thirds the force of horizontal draught required for wagons and carriages. On rough roads the resistance is slightly diminished by springs.

On soft roads, as earth, sand, or gravel, the number of pounds draught is but little affected by the speed; that is, the resistance is no greater in driving on a trot than on a walk; but on hard roads it becomes greater as the velocity increases. Thus, a carriage on a dry pavement requires one-half greater force when the horses are on a trot than on a walk, but on a muddy road the difference between the two rates of speed is only about one-sixth. On a railroad, where a draught of ten pounds will draw a ton ten miles an hour, the resistance increases so much at a high degree of speed, as to require a force of fifty pounds per ton at sixty miles an hour. That is, it would require five times as much actual power to draw a train one hundred miles at the latter rate, than at the former. But as the speed is six times as great, the actual force *during a given time*, would be thirty times as great.

Wheels with wide tire run more easily than narrow tire, on soft roads; on hard smooth roads, there is no sensible difference. Wide tire is most advantageous on gravel and new broken-stone roads, both by causing the vehicles to run more easily, and by improving the surface. For the latter reason, the New-York turnpike law allows six inch wheels to pass at half price, and twelve inch wheels to pass free of toll. Wheels with broad tire on a farm would pass over clods, and not sink between them; or would only press the surface of new meadows, without cutting the turf. But where the ground becomes muddy, the mud closes on both sides of the rim and loads the wheels. On clayey soils, narrow tire unfits the roads for broad wheels. For these reasons broad wheels are decidedly objectionable for clayey or soft soils, and they are chiefly to be recommended for broken-stone roads, and gravelly or dry sandy localities. They are also much the best for the wheels of drilling-machines, which only pass over mellowed surfaces.

The larger wheels are made, the more easily they run; thus a wheel six feet in diameter meets with only half the resistance of a wheel three feet in diameter.

Digitized by Google

A flat piece of wood, sliding on one of its broad surfaces, is subject to the same amount of friction, as when sliding upon its edge. Hence the friction is the same provided the pressure be the same, whether the surface be small or large.* Or, in other words, if the surfaces are the same, a double pressure produces a double amount of friction; a triple pressure, a triple amount, and so on.

Friction is entirely independent of velocity. That is, if a force of ten pounds, is required to turn a carriage wheel, this force will be ten pounds, whether the carriage is driven one or five miles per hour. Of course it will require five times as much force to draw five miles per hour, because five times as much is expended in every other way.

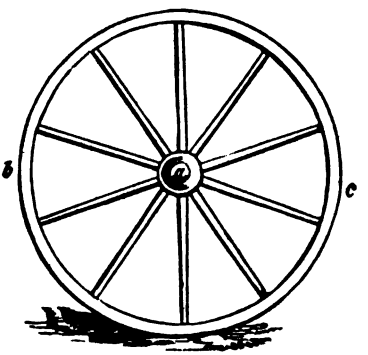


FIG. 60.

A carriage wheel or any other wheel revolving on an axle, will run more easily as the axle is made smaller. This is not owing to the rubbing surfaces being less in size, as some mistakenly suppose; for it has just been shown that this makes no difference provided the pressure is the same. But it is owing to the leverage of the wheel on the friction at the axis; and the smaller the axle, the greater is this leverage. For, if the axle *a*, Fig. 60, be six inches in circumference, and the wheel, *b*, *c*, be ten feet in circumference, then the outer part of the wheel will move twenty times farther than the part next the axle. Therefore according to the rule of virtual velocities, one ounce of force at the rim of the wheel will overcome twenty ounces of friction at the axle. Or if the axle were twice as large, then according to the same rule, it would require two ounces to overcome the same friction acting between larger surfaces.†

* Generally speaking, this is correct; but when the pressure is very intense the friction is slightly less on the smaller surface.

† The slower motion of rubbing surfaces does not diminish the friction, for it is about the same whether the motion be fast or slow; in precisely the same way that the weight of a stone remains the same whether lifted slowly or quickly by a lever. If the friction of the wheels of a wagon on their axles be equal to ten pounds, driving the horse fast or slowly, will not increase or diminish it. But fast driving will require more strength, for the same reason, that a man would need more strength to carry a bag of wheat up two flights of stairs than one, in one minute of time.

Digitized by Google

Friction Wheels.

On this principle, *friction-wheels or friction-rollers* are constructed for lessening as much as possible the friction of axles, in certain cases. By this contrivance, the axle *a*, Fig. 61, instead of revolving in a simple hole or cavity, rests on or between the edges of two other wheels. As the axle revolves, the edges turn with it, and the rubbing of surfaces is only at the axles of these two wheels. If, therefore, these axles be twenty times smaller than the wheels, the friction will be only one-twentieth the amount without them. This contrivance has been strongly recommended and considerably used for the cranks of grindstones; but it was not found to answer the intended purpose so well as was expected, for the very plain reason that in using a grindstone nearly all the friction is at the circumference, or between the stone and the tool, which friction wheels could not of course remove.

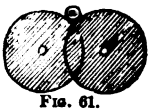


Fig. 61.

Lubricating Substances.

Lubricating substances, as oil, lard, and tallow, applied to rubbing surfaces, greatly lessen the amount of friction partly by filling the minute cavities, and partly by separating the surfaces. In ordinary cases, or where the machinery is simple, those substances are best for this purpose which keep their places best. Finely powdered black lead, mixed with lard, is for this reason better for greasing carriage wheels than some other applications. Drying oils, as linseed, soon become stiff by drying, and are of little service. Olive oil, on the contrary, and some animal oils, which scarcely dry at all, are generally preferred. To obtain the full benefit of oil, the application must be frequent.

According to the experiments made with great care by Morin at Paris, the friction of wooden surfaces on wooden surfaces is from one-quarter to one-half the force applied; and the friction of metals on metals, one-fifth to one-seventh,—varying in both cases with the kinds used. Wood on wood was diminished by lard to about one-fifth to one-seventh of what it was before; and the friction of metal on metal was diminished to about half what it was before; that is, the friction was about the same in both cases after the lard was applied.

Digitized by Google

To lessen the friction of wooden surfaces, lard is better than tallow by about one-eighth or one-seventh; and tallow is better than dry soap about as two is to one. For iron on wood, tallow is better than dry soap about as five is to two. For cast iron on cast iron, polished, the friction with the different lubricating substances is as follows:

Water,	31
Soap,	20
Tallow,	10
Lard,	07
Olive oil,	06
Lard and black lead,	05

When bronze rubs on wrought iron, the friction with lard and black lead is rather more than with tallow, and about one-fifth more than with olive oil. With steel on bronze, the friction with tallow and with olive oil is about one-seventh less than with lard and black lead.

As a general rule, there is least friction with lard when hard wood rubs on hard wood; with oil, when metal rubs on wood, or metal on metal; being about the same in each of all these instances.

In simple cases, as with carts and wagons, where the friction at the axle is but a small portion of the resistance,* a slight variation in the effects in the lubricating substance is of less importance than retaining its place. In more complex machinery, as horse powers for threshing machines, friction becomes a very large item, unless the parts are kept well lubricated with the best materials.

Leather and hemp bands, when used on drums for wheelwork, should possess as much friction as possible to prevent slipping, thus avoiding the necessity of tightening them so much as to increase the friction of the axles. Wood with a rough surface has one-half more friction than when worn smooth, hence moistening and rasping small drums may be useful. Facing with buff leather or with coarse thick cloth also accomplishes a useful purpose.

Although friction is often a serious inconvenience or loss in lessening the force of machines, there are many instances in which it

* If the friction at the axle be one-twelfth of the force, and the diameter of the wheels ten times as great as the diameter of the axle, the friction at the axles will be reduced to one hundred and twentieth part of the force—according to the law of virtual velocities as applied to the wheel and axle.

Digitized by Google

performs important offices in nature and in works of art. "Were there no friction, all bodies on the surface of the earth would be clashing against each other; rivers would dash with unbounded velocity, and we should see little besides collision and motion. At present, whenever a body acquires a great velocity, it soon loses it by friction against the surface of the earth; the friction of water against the surfaces it runs over soon reduces the rapid torrent to a gentle stream; the fury of the tempest is lessened by the friction of the air on the face of the earth; and the violence of the ocean is subdued by the attrition of its own waters.

"Its offices in the works of art are equally important. Our garments owe their strength to friction; and the strength of ropes depends on the same cause; for they are made of short fibres pressed together by twisting, causing a sufficient degree of friction to prevent the sliding of the fibres. Without friction, the short fibres of cotton could never have been made into such an infinite variety of forms as they have received from the hands of ingenious workmen."* Deprived of this retaining force, the parts of stone walls, piles of wood and lumber, and the loads of carts and wagons, as well as the wheels themselves, would slide without restraint, as if their surfaces were of the most icy smoothness, and walking without support would be impossible.

The tractive power of locomotives depends on the friction between the wheels and iron rails, which is equal to about one-fifth of the weight of the engine; that is, a locomotive weighing fifteen tons will draw with a force of three tons, without producing slipping of the wheels.

Principles of Draught.

An examination of the nature or laws of friction enables us to ascertain the best line of draught for teams when attached to wagons and carriages. If there were no friction whatever upon the road, the best direction for the traces would be parallel to the road, that is, on a level with the wagon. But as there is always some friction, the line of draught should be a little rising, so as to tend to lessen the pressure of the wheels on the road.

Now this upward direction of the draught, *should always be ex-*

* Encyc. Amer.

Digitized by Google

actly of such a slope, that if the same slope were given to the road the wagon would just descend by its weight. The more rough or muddy the road is, the steeper should be this line of draught, or direction of the traces. On a good common road, it would be much less; and on a plank road, but slightly varied from a horizontal direction. On a railroad, the line should be about level. On good sleighing, some of the strength of the team is commonly lost by too much slope to the draught.

The reason of this rule may be understood by the following explanation: Let the obstruction, *a*, in the annexed figure, (Fig. 62,) represent the friction the wheel constantly meets with in rolling over a common road. To overcome this friction, the wheel must rise in the direction of the dotted line. Therefore if the force is made to pull in this direction, it will act more advantageously than in any other, because this is the course in which the centre of the wheel must move. Now, if a downward slope were given to the road at this obstruction, the wheel and the obstruction would be brought on a level, and the wheel would move with the slightest degree of force.

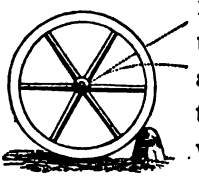


FIG. 62.

It will be understood from the preceding rule, that a sled running on bare ground should be drawn by traces bearing upward in a large degree. The same remark will apply to the plow, which slides upon the ground in a similar way with the pressure of the turning sod as a load. Hence the reason that a great saving of strength results from the use of short traces in plowing. An experiment was tried for the purpose of testing this reasoning; first, with traces of such length that the horses' shoulders were about ten feet from the point of the plow; and secondly, with the distance increased to about fifteen feet. With the short traces a strength was required equal to $2\frac{1}{4}$ cwt., but with the long traces it amounted to $3\frac{1}{2}$ cwt.

But the draught-traces may be made too short. When this is the case, the plow is necessarily thrown too much upon its point to keep it from flying out of the ground, by which means it works badly in turning the furrow. In addition to this evil, the plowman is compelled to bear down heavily, adding to the friction of the sole on the bottom of the furrow, and greatly increasing his labor.

Digitized by Google

The line of draught should be so adjusted that the plow may press equally all along on the bottom, which will cause it to run more evenly and with a steadier motion than by any other way. This end will be effected by giving the traces or draught-chain just such a length that the share of the plow, the clevise, and the point of draught at the horses' shoulders (or the ring of the ox-yoke) shall form a straight line. This is shown in the annexed figure, where A is the place of the ox-ring or of the forward extremity of the traces. (Fig. 63.)

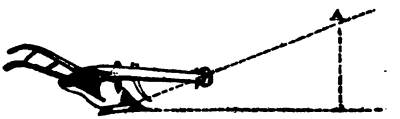


Fig. 63

So great is the difference between an awkward and skilful adjustment of the draught to the plow, that some workmen with a poor instrument have succeeded better than others have with the best; and plows of second quality, have sometimes, for this reason, been preferred to those of the most perfect construction.

HYDRODYNAMICS.*

Hydrostatics† treats of the weight and pressure of liquids when not in motion; Hydraulics,‡ of liquids in motion, as conducting water through pipes, raising it by pumps, &c.; and Hydrodynamics, of the forces of liquids, as for example in applying it as a moving power. As these are intimately connected, they will be all treated under one general head in the following pages.

Hydrostatics.

A remarkable property of liquids is their pressure *in all directions*. If we place a solid body, as a stone, in a vessel, its weight will only press upon the bottom. But if we pour in water, the water will not only press upon the bottom, but against the sides. For, bore a hole into the side, and the side-pressure will drive out the water in a stream. Or, bore small holes into the sides and bottom of a tight wooden box, stopping them with plugs. Then press this box, empty, bottom downwards into water, allowing none to run in at the top. Now draw one of the side plugs, and the water will be immediately driven into the box by the pressure outside.

* From two Greek words, *hudor*, water, and *dunamis*, power.

† From two Greek words, *hudor*, water, and *statos*, to stand or sustain.

‡ From two Greek words, *hudor*, water, and *aulos*, a pipe.

Digitized by Google

If a bottom plug be drawn, the water will immediately spout up into the box, showing the pressure *upwards* against the bottom. Hence the pressure in *all directions*, upwards, sideways and downwards, is proved.

The upward pressure of liquids may be shown by pouring into one end of a tube bent in the shape of the letter U, enough water to partly fill it; the upward pressure will drive it up on the other side, till the two sides are level.

On this principle depends the art of conveying water in pipes under ground, across valleys. The water will rise as high on the opposite side the valley as the spring which supplies it. The ancients who were unacquainted with this property of liquids, conveyed water on lofty aqueducts of costly masonry, built level across the valleys.

If the valleys are deep, the pipes must be strong, because the higher the head of water the greater is the pressure. For the same reason, dams and large cisterns should be strongest at bottom.

The amount of pressure which any given height of water exerts upon a surface below, may be understood by the following simple calculation:

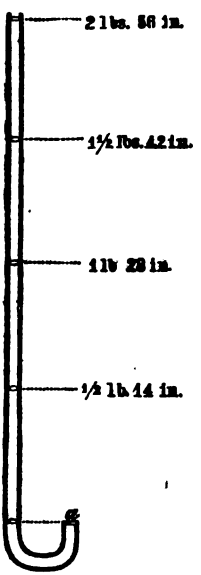


FIG. 64.

If there be a tube one inch square, (with a closed end,) half a pound of water poured into it will fill it to a height of fourteen inches;* one pound will fill it twenty-eight inches; two pounds, fifty-six inches; ten pounds, twenty-three feet; twenty pounds, forty-six feet; and so on. Now as the side pressure is the same as the pressure downwards for the same head of water, the same column will of course exert an equal pressure on a square inch of the *side* of the tube. Or, if the tube be bent, as shown in the annexed figure, (Fig. 64,) the pressure upwards on the end of the tube at *a*, will be the same for the various heights.

Now, as the pressure of a column fifty feet high, is about twenty-two pounds on a square inch, the pressure on the *four* sides is equal to eighty-eight pounds, for one inch in length.

* This is nearly correct. For, a cubic foot (or 1728 cubic inches) of water weighs 62 lbs. Consequently one pound will be 27.9 cubic inches, and will fill the tube nearly 28 inches high.

Digitized by Google

Hence the reason that considerable strength is required in tubes which have much head of water, in order to prevent their being torn open by its force.

The question may now arise, and it is a very important one, How thick must be a lead tube of this size to prevent danger of bursting with a head of fifty feet, or of any other height? To answer it, let us turn to the table of the *strength of materials* in a former part of this work, where we find that a bar of cast lead one-fourth of an inch square, will bear a weight of fifty-five pounds. If the tube be only one-sixteenth of an inch thick, one inch of one of its sides will possess an equal strength, that is, will bear fifty-five pounds only, and the tube would consequently burst with fifty feet head. If one-tenth of an inch thick, the tube would just bear the pressure; and to be safe, should be about twice as thick, or one-fifth of an inch. Half this thickness would be sufficient for twenty-five feet of water, which would require to be doubled for one hundred feet. A round tube, one inch in diameter, having less surface to its sides, would be about one-third stronger. A tube twice the diameter would need twice the thickness; or if less in diameter, a proportionate decrease in thickness might take place. If instead of cast-lead, milled-lead were used, the tube would be nearly four times as strong, according to the table of the strength of materials already referred to.

The pressure of liquids upon any given surface is always exactly in proportion to the height, no matter what the shape of the vessel may be. If for instance, the vessel *a*, Fig. 65, be one inch in diameter, and the vessel *b*, be three inches in diameter, the water being equally high in both, the pressure on the whole bottom of *b*, will be nine times as great as on the bottom of *a*; or any one inch of the bottom of *b* will receive as great a pressure as the bottom of *a*. Again, if the vessel *c*, broad at the top be narrowed to only an inch in diameter at bottom, the pressure upon that inch will be still the same, most of the weight of its contents resting against the sides *d d*.

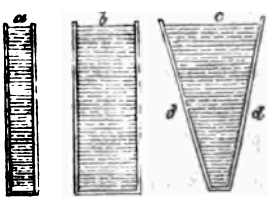


Fig. 65.

If the vessel A, Fig. 66, be filled with water to a height of four-

Digitized by Google

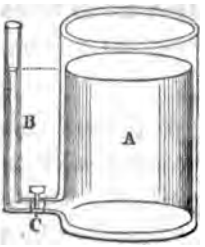


FIG. 66.

teen inches, the pressure will be half a pound on every square inch of the bottom, or upon every square inch of the sides fourteen inches below the surface. If the tube C be an inch square, the water will be driven into it with a force of half a pound, and will press with that force against the one inch surface of the stop-cock C. If the tube B, be now filled to an equal height, the same force will be exerted against the other side. To prove this, let the stop-cock be opened, when the two columns of water will stand at an exact level.

If enough water be now poured into the tube B, to fill it to the top, it will immediately settle down on a level with the water in A, raising the whole surface in the latter. This result has seemed very strange to many, who cannot conceive how a small column of water can be made to balance a large one. But this difficulty entirely vanishes, when we remember, that the water in the larger vessel rises as much more slowly than it descends in the smaller, as the large one exceeds the smaller; thus acting on the principle of virtual velocities in precisely the same manner that a heavy weight on the short end of a lever is upheld by a small weight on the long end. The great mass of water is supported directly by the bottom of A, in the same way that nearly all the weight on the lever is supported by the fulcrum. A man who was seeking a solution to the absurd mechanical problem of perpetual motion, and who supposed that the large mass in A would overbalance the small column in B, and drive it upwards, constructed a vessel in the form shown in Fig. 67, so that the small column when forced upwards would flow back into the larger vessel perpetually. He was, however, greatly surprised to see the fluid in both divisions settle at the same level.*

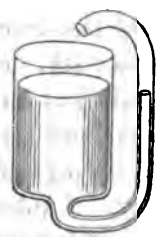


FIG. 67.

This principle may be further explained by the following experiment: A B, (Fig. 68,) represents the inside of a metallic vessel, with a bottom C, which slides up and down water-tight. If water be poured in to fill the lower or larger part only, it will be found to press on he sliding bottom with a force exactly equal to its own

* Tomlinson's Mechanics.

Digitized by Google

weight; that is, if there is a pound of water, it will press on the bottom with a force equal to one pound. Now, if the bottom be pushed upwards, so as to drive the water into the narrow part of the vessel, the pressure upon the bottom becomes instantly much greater, or equal to many pounds, the water being the same as before. Suppose the narrow part of the vessel is twenty times smaller than the larger part; then in pushing the bottom up one inch, the water is driven twenty inches upwards in the tube. So then, according to the rule of virtual velocities, it will require twenty times the force, because it moves upwards twenty times faster.* This then, is precisely similar to the instance where a pound on the longer end of a steel-yard balances twenty pounds on the shorter end. In this instance, the upper parts, D D, of the vessel operate as the fulcrum of a lever, and offer resistance to the sliding part, as soon as the water begins to ascend the tube.

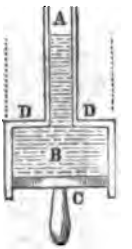


Fig. 68.

This principle is exhibited in the hydrostatic bellows, which consists of two round pieces of board, connected by a narrow strip of strong leather, in the top is inserted a long narrow tube with a small funnel at the top. When water is poured into this tube, it will raise a weight as much greater than the weight of the water in the tube, as the surface of the upper board exceeds the cross section of the tube. Thus, if a pound of water fills a tube half an inch in diameter, and the bellows are two feet in diameter, then this pound will raise more than two thousand pounds on the bellows (if they are strong enough,) because the surface of the bellows is more than two thousand times greater.

In the same way a strong iron-bound hogshead may be burst with the weight of a single gallon of water, by pouring it into a long and narrow tube, set upright into the bung of the hogshead. If, for instance, the inner surface of the hogshead be 20 square feet, or 2,880 square inches, a tube of water 23 feet high will press with a force of 10 pounds on every square inch, or equal to a force of 28,800 pounds, or 14 tons on the whole surface.

The *hydrostatic press* owes its extraordinary power to a similar principle; but instead of a bellows there is a moving piston in a

* The pressure will be as great upon the bottom, as if the vessel continued a uniform size all the way up, as shown by the dotted lines.

Digitized by Google

strong metallic cylinder; and instead of the mere weight of the water, it is driven into the cylinder by means of the lever of a powerful forcing pump. An instrument of this sort, possessing enormous power, was used to elevate the great tubular iron bridge in England. It was found necessary to make the sides of the cylinder into which the water is driven no less than eleven inches thick of solid iron; and so great was the pressure given to the confined water, that it would have thrown it up a tube higher than the summit of Mont Blanc.

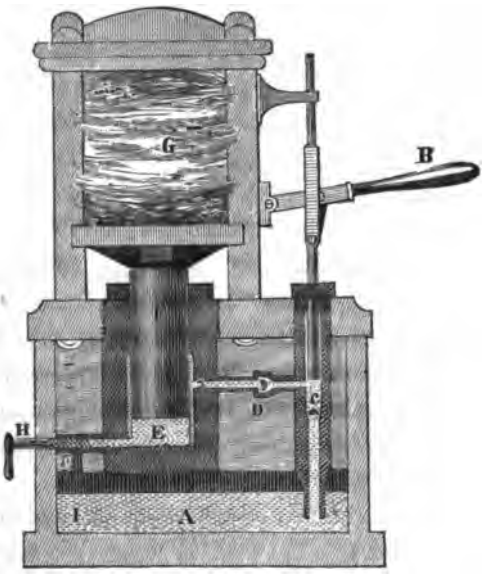


FIG. 69.

The hydrostatic press is applied with great advantage in compressing hay and other bulky substances into a compact form, so that they may occupy but little space for conveyance to distant markets. The accompanying figure, (Fig. 69,) exhibits the different parts of this powerful machine. A, is a cistern to supply water, which is raised by working the handle B, of the forcing pump; the water passes through the valve C, opening upwards, and through the spring-valve D, opening towards the large cylinder E. Being thus driven into the space E, it raises the piston F, and exerts a prodigious pressure upon the mass of hay, G. The piston is lowered by turning the screw H, which allows the water to pass back into the cistern at I. In the figure, the hay is shown as visible to the sight, in order to represent the whole more plainly. But in practice, it is thrown into a square box or chamber of strong plank, of the size of the intended bundle. One side is hung upon stout hinges, and is opened for the removal of the hay when the pressing is completed.

Digitized by Google

To estimate the power of this machine, divide the square of the diameter of the piston F, by the square of the diameter of the piston of the forcing-pump, and multiply the quotient by the power of the lever B. For example, suppose the piston F is 16 inches in diameter, and the piston of the forcing-pump is 2 inches in diameter. Then the square of 16 is 256; divide this by 4, the square of 2, and the result will be 64. If the lever B increases the power five times, the whole power of the machine will be 1,280; that is, a force of one pound applied to the lever will raise the large piston with a force equal to 1,250 pounds; or, if a force of 50 pounds be given to the lever, the power will be 60,000 pounds, or 30 tons. Reducing the diameter of the smaller piston to half an inch, and increasing the force of the lever to ten times, the whole power exerted will be thirty-two times as great, or equal to 960 tons. In ordinary practice, it is more convenient and economical to reduce the diameter of the larger piston to a few inches only, making the forcing-pump correspondingly small, the power depending entirely on the disproportion between them. Such presses may be worked rapidly by horse, water or steam power.

One great advantage which the hydrostatic press possesses over those worked by screws, is the little friction among liquids, nearly the only friction existing being that of the two pistons, which is comparatively small. Another is the smallness of the compass within which the whole is comprised; for a man might, with one not larger than a tea-pot, standing before him on a table, cut through a thick bar of iron, with as much ease as he could chip pasteboard with a pair of shears.

Hydraulics.—Liquids in motion, are subject to the same laws as solids in motion. Falling water increases in velocity in the same way that the motion of falling solids is accelerated, as already explained under the head of *Gravitation*. Thus, a perpendicular stream of water descends one foot in a quarter of a second, four feet in half a second, nine feet in three-fourths of a second, and sixteen feet in one second. Like falling solids, the velocity at the end of the first quarter will be eight feet per second; at the end of the second quarter, sixteen feet per second; at the end of the third quarter, twenty-four feet per second; and at the end of the fourth quarter, thirty-two feet per second.

Digitized by Google

Now, if there be an orifice made in the side of a vessel of water, the water will spout out with the same swiftness, as if it fell perpendicularly from an equal height, were it not retarded a little by friction. For example, if the head of water is one foot above the orifice, the velocity would be at the rate of eight feet per second, but for friction, which reduces it to about five and a half feet* per second. The velocity for any other height of head, may be easily found by deducting the same proportionate rate from the velocity of a falling body. Thus, for example, if the head be sixteen feet, the speed would be thirty-two feet, (as shown under *Gravitation*,) from which, deducting the friction, the real velocity would be about twenty-two feet per second.

It has been already shown that the velocity of a falling body increases at the same rate as the increase in the time of falling; for instance, the speed is twice as great in two seconds as in one; three times as great in three seconds, four times as great in four seconds, and so on. But the *distance fallen through* increases as the *square* of the time, that is, it is four times as great in two seconds, nine times as great in three seconds, sixteen times as great in four seconds, &c. Thus we see that in order to produce a two-fold velocity, a four-fold height is necessary, &c. So also in the escape of water under a head, to double the velocity of the stream, the head must be four times as high; to triple it, the head must be nine times as high, &c.

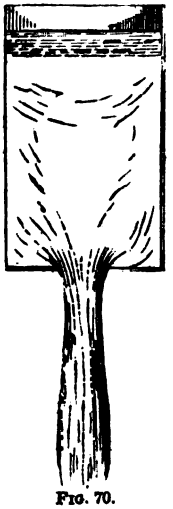


FIG. 70.

The discharge of water from a vessel is greatly influenced by the nature of the orifice through which it flows. If, for example, a vessel or cistern have a thin bottom of tin, with a smooth circular hole, we might naturally suppose that the discharge would be as easy as it could be made, and that water would pass as rapidly through it, as through any orifice of an equal size. But this is not the fact. As the particles approach this orifice, their motion throws them across, and they partly obstruct the opening; it will be seen

*Or, more accurately, 5.4 feet per second.

Digitized by Google

that they converge towards a point just under the orifice, where the stream will be considerably contracted, (Fig. 70.) If a short tube be inserted into the hole, (the head being the same,) this crossing of particles will be partly prevented, and the liquid will flow more rapidly. The greatest effect is produced when the tube is twice as long as its diameter, (Fig. 71.) If the tube be enlarged at its upper and lower end, similar to the form of the contracted stream of water, in Fig. 70, the quantity discharged is greatly increased, (Fig. 72.)

Fig. 71.

Fig. 72.

When water flows down an inclined plane, the same law applies as to the motion of a solid body rolling down a plane. The velocity increases as the square of the distance, and is the same as the velocity of a body falling freely downwards to a height equal to the perpendicular height of the plane. Unless the stream, however, is very large, its speed is quickly diminished by the friction of its channel,* until the friction becomes as great as the descending force, after which the motion becomes uniform. Hence the reason that large streams, with an equal degree of descent, flow so much more rapidly than small ones, the gravitating force being so much greater that friction has less effect upon them.

In pipes, which wholly surround the flowing stream of water, the friction becomes still greater, and is only obviated by making the pipe of larger dimensions than would otherwise be the case, so as to allow a free passage of a sufficient quantity of water through the centre of the tube, while a ring or hollow cylinder of water is considered to be nearly at rest all around it. The tables at the end of this department exhibit this decreased velocity in tubes of various sizes.

Velocity of Water in Ditches.

It is often of great practical utility to know what amount of water may be carried off in draining, or supplied in irrigation, by

*Which increases as the square of the velocity.

Digitized by Google

channels of any given size and descent. The following rule will apply to all cases, from the plow-furrow to the mill-race, or even to the large river, and may be used by any boy who understands common arithmetic.

To ascertain the mean (or average) velocity of water in a straight channel of equal size throughout:

Let f=the fall in one mile in inches;

Let d=the hydraulic mean depth;

Let v=velocity in inches per second;

Then $v=1.23\sqrt{df}$—or, in plain words, the velocity is equal to the hydraulic mean depth multiplied by the fall, with the square root of this product extracted, and then multiplied by 1.23

The *hydraulic mean depth* is a quantity, which when multiplied by the perimeter* of the channel in contact with the water, gives an area equal to the area of the cross section of the stream of water.

This rule may be rendered quite plain by an example. Suppose a smooth furrow is cut six inches wide and four inches deep, with perpendicular sides, and that it descends one inch in a rod; to find the quantity of water that will flow through it. One inch fall in a rod is 320 inches in a mile. The perimeter in contact with the water will be six inches on the bottom, and four inches in each side=14 inches. The area of the cross section will be 6 times 4=24, which divided by 14, the perimeter, gives 1.7=the hydraulic mean depth. Then, by applying the preceding rule:

$V=1.23\sqrt{320\times1.7}=1.23\times7.4=9.1$ inches, the velocity per second; which would be about one gallon per second, or a hogshead per minute.

An open ditch, therefore, conveying a stream of this size, would carry off in three hours, from an acre of land, all the water which might fall by half an inch of rain during the wet season; for half an inch of rain would be 180 hogsheads per acre, sixty of which would pass off each hour; or it would supply in three hours, by the process of irrigation, as much water as a heavy shower of half an inch. Where the descent is greater, the increased quantity may be readily calculated by the rule given. The capacity of smooth-sided underground channels may be determined in the same way; but if built of rough stones, great allowance must be made.

*The perimeter is the aggregate breadth of the different sides of the channel.

Digitized by Google

In common practice, however, considerable allowance must be made for the rough sides, which tend to impede the current in small ditches. By this rule, the exact degree of descent in a sixty-mile "level" of the Erie canal, was calculated, so that the current might be precisely half a mile per hour; the canal was dug and completed according to this calculation. When the water was let in, the whole channel filled evenly from one end to the other, with a current of precisely half a mile an hour.

Levelling Instruments.

The simplest mode of *levelling* or ascertaining the slope for ditches, is to cut a few yards of the ditch so that water may stand in it, and then to set two sticks perpendicularly, both rising to an equal

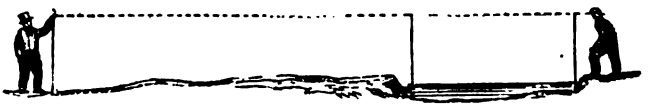


Fig. 73.

height above the surface. The sticks should be measured at equal distances from the top downwards, and marked, and then pressed into the earth till the water reaches the mark. The level may then be determined with mueh accuracy by "sighting" over the tops of these sticks. The annexed figure exhibits this arrangement. The shorter the stick, and the longer the piece of water, the less will be the liability to error.

The following simple mode may be sufficiently accurate where the descent of the ditch is considerable. A, (Fig. 74,) is a common square, placed in a slit in the top of the stake B. By means of a plumb-line, the square is brought to a level, when a thumb screw at C fixes it fast. If the square is two feet long, and is so carefully adjusted by means of the plumb-line, as not to vary more than the twentieth of an inch from a true level, which is easily accomplished; then, a twentieth of an inch in two feet will be one inch in forty feet, a sufficient degree of accuracy for many cases.

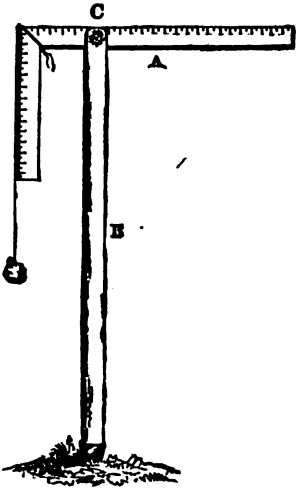


Fig. 74.

Digitized by Google

Where greater accuracy is required, as in long and nearly level ditches, the "water level" may be used. It may be made of a lead tube about three feet long, bent up an inch or two at each end, and stiffened by fastening to a wooden bar, A, B, (Fig. 75.) Into each end is cemented, with sealing-wax, a small and thin vial with the bottom broken off, so that when the tube is filled with water, it may rise freely into the vials. If the tube be now filled with water colored with cochineal or any dye-stuff, and then placed upon the tripod C, by looking across the two surfaces of liquid in the vials, an accurate level may be obtained. When not in use, a cork is placed into each vial. "Sights" of equal height, fastened to pieces of cork floating on the water, as shown in Fig. 76, give a more distinct line. The sights are formed of fine threads or hairs stretched across the square openings. To ascertain whether these threads are both of equal heights above the water, let a mark be made where they intersect some distant object; then reverse the instrument, or turn it end for end, and observe whether the threads cross the same mark. If they do, the instrument is correct; but if they do not, then one of the sights must be raised or lowered until properly adjusted.

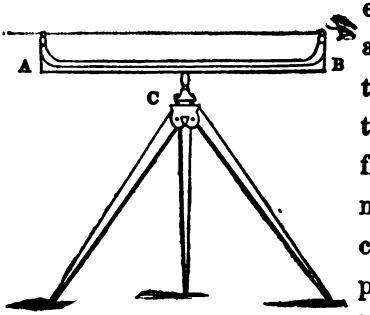


FIG. 75.

FIG. 76.

In laying out canals and railroads, where extreme accuracy is needed, the *spirit level* attached to a telescope is used. So great is the perfection of this instrument, that separate lines of levels have been run with it for sixty miles without varying one inch for the whole distance.

The use of a cheap and simple instrument to determine the position and descent of ditches, with ease and precision, before commencing with the spade, will save a vast amount of the trouble and expense which those often meet with, whose only method is to "*cut and try.*"

Digitized by Google

Hydraulic Machines.

Machines for raising water are of frequent use on every farm. One of the simplest contrivances for this purpose, is *the screw of Archimedes.* It may be easily made by winding a lead tube around a wooden cylinder or rod, (Fig. 77,) in the form of a screw. When placed in an inclined position, with one end in water, and made to revolve, the water resting at the lower side of each turn of the screw, is gradually carried from one end to the other, and discharged at the upper extremity. Its simplicity and small liabili- to get out of order, renders the Archimedian screw sometimes useful, where water is to be raised from an open stream to a short distance, as for irrigation; the motion being easily imparted to it by means of a small water-wheel driven by the stream.

Fig. 77.

Great improvement has been made in the *common pump* for farms within the past ten years. The best cast-iron pumps, made almost wholly of this metal, far exceed in durability and ease of working, those formerly constructed of wood, and excel all others in cheapness.

The most perfect pump, perhaps, in present use is the best constructed *chain-pump*, a cross section of which is shown in Fig. 78. The chain is made to revolve rapidly on the angular wheel by means of a winch attached to the upper one, and being furnished with a regular succession of metallic discs which nearly fit the bore in the tube *a*, the water is carried up in large quantities. When the motion is discontinued, the water settles down again into the well, and consequently this pump is not liable to accident by freezing. By sweeping rapidly through the water, it preserves it in better condition and prevents stagnation. The friction being very small, it will last a long time without wearing out.

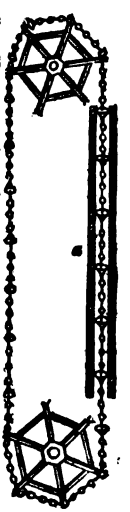


Fig. 78.

Digitized by Google

One of the most ingenious and useful machines for elevaing water is the *water ram*. It might be employed with great advantage on many farms, were its principle and mode of action better understood. By means of a small stream, with only a few feet fall, a current of water may be driven to an elevation of fifty to a hundred feet above, and conveyed on a higher level to pasture fields for irrigation, or to cattle-yards for supplying drink to domestic animals, or to the kitchen of dwellings for culinary purposes.

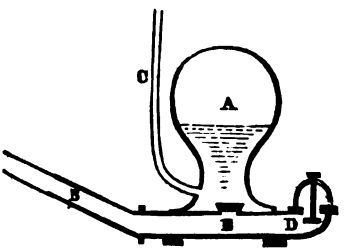


FIG. 79.

Its power depends on the momentum of the stream. Its principal parts are the reservoir or air chamber, A, Fig. 79, the supply pipe B, and the discharge pipe C. The running stream rushes down the supply pipe B, and striking the waste valve D, closes it. The stream being thus suddenly stopped, its momentum opens the valve E upwards, and drives the water into the reservoir A, until the air within being compressed into a smaller space, by its elasticity, presses down upon the water and again closes the valve E. The water in the supply pipe B, has by this time expended its momentum and stopped running; therefore the valve D drops open again, and permits it to escape. It recommences running, until its force again closes the waste valve D, and a second portion of water is driven into the reservoir as before, and so it repeatedly continues. The great force of the compressed air in the reservoir drives the water up the discharge pipe C to any required height or distance.

The mere *weight* of the water will only cause it to rise as high as the fountain head; but like the momentum of a hammer, which drives a nail into a solid beam, which a hundred pounds would not do by pressure, the *striking-force* of the stream exerts great power.

The discharge pipe C, is usually half an inch in diameter, and the supply pipe should not be less than an inch. A fall of two or three feet in the stream, with not less than half a gallon of water per minute, with a supply pipe forty feet long will elevate water to a height as great as the strength of common half inch lead pipe

Digitized by Google

will bear.* The greater the height in proportion to the fall of the stream, the less will be the quantity of water elevated as compared with the quantity flowing in the stream.

Unlike a pump, there is no friction or rubbing of parts in the water-ram, and it will act for years without repairs, continuing through day and night its constant and regular pulsations, unaltered and unobserved.

Waves.

An inverted syphon, or bent tube like that shown in Fig. 80, may be used to exhibit the principle on which depends the motion of the waves of the sea. The action of the waves on shores and banks, and the inroads which they make upon farms situated on the borders of lakes and large rivers, present an interesting subject of inquiry.

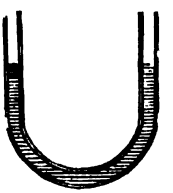


Fig. 80.

If the bent tube, Fig. 80, be nearly filled with water, and the surface be driven down in one branch by blowing suddenly into it, the liquid will rise in the other branch. The increased weight or head of this raised column, will cause it to fall again, its momentum carrying it down below a level, and driving the water up the other branch. The surfaces will therefore continue to vibrate, until the force is spent. The rising and falling of waves depend on a similar action. The wind by blowing strongly on a portion of the water of the lake or sea, causes a depression, and produces a corresponding rise on the adjacent surface. The raised portion then falls by its weight, with the added force of the wind upon it, until the vibrations increase into large waves.

The waves thus produced have a progressive motion, (for reasons to be presently shown,) as every one has observed. A curious optical deception attending this advancing motion, has induced many to believe that the water itself is rolling onward. But this is not the fact. The boat which floats upon the waves is not carried forward with them; they pass underneath, now lifting it on their summits, and now letting it sink into the hollows between. The

* When water is raised to a considerable elevation by means of the water-ram, the reservoir must possess great strength. If the height be one hundred feet the pressure, as shown on a former page, is about forty-four pounds to the square inch. With an internal surface, therefore, of only two square feet, the force exerted by the column of water, tending to burst the reservoir, would be equal to more than twelve thousand pounds.

Digitized by Google

same effect may be observed with the water-fowl which sits upon the surface. It often happens, indeed, that the waves on a river roll in an opposite direction to the current itself.

If a cloth be laid over a number of parallel rollers, so far apart as to allow the cloth to fall between them, and a progressive motion be then given to them, the cloth remaining stationary, a good representation of waves will be afforded, and the cloth will appear to advance. Or if a strip of cloth be laid on a floor, repeated jerks at one end will produce a similar illusion.

FIG. 81.

It is only the *form* of the wave, and not the water which composes it, which has an onward motion. Let the dark line in Fig. 81, represent the surface of the water. A, is the crest of one of the waves, and being higher than the surface at B, it has a tendency to fall and B to rise. But the momentum thus acquired carries these points so far that they interchange levels. The same change takes place with the other waves, and the dotted line shows the newly formed surface as the water thus sinks in one place and rises in another. The same process is again repeated and each wave thus advances farther on, and the progressive motion is continually kept up.

Each wave contains, at any one moment, particles in all possible stages of their oscillation; some rising and some falling; some at the top and and some at the bottom; and the distance from any row of particles to the next row that is in precisely the same stage of oscillation, is called *breadth* of the wave, that is, the distance from crest to crest or from hollow to hollow.

There is a striking similarity between the rising and falling of waves, and the vibrations of a pendulum; and it is a very interesting and remarkable fact that a wave always travels its own breadth in precisely the same time that a pendulum whose length is equal to that breadth, performs one vibration. Thus, a pendulum 39⅛ inches long beats once in each second; and a wave whose breadth is 39⅛ inches travels that breadth in one second. The length of a pendulum must be increased as the square of the time for its vi-

Digitized by Google

brations; that is, to beat but once in two seconds, it must be four times as long as for one second; to beat once in three seconds, it must be nine times as long, and so on. In the same way waves which travel their breadth in two seconds are four times as wide as those travelling their breadth in one second; and thus their breadth, and consequently their speed, increases as the square of the time. Large waves therefore roll onward with far greater velocity than small ones. If only thirty-nine inches wide, they move about two and a quarter miles an hour, and pass once each second; if

13 ft.	wide,	they move	$4\frac{1}{2}$	miles an hour,	passing once in	2	seconds.
52	do	do	$9\frac{1}{16}$	do	do	4	do
209	do	do	18	do	do	8	do
836	do	do	36	do	do	16	do

Although the water itself does not advance where there is much depth, yet when it reaches a shore or beach, the hard and shallow bottom prevents it from falling or subsiding, and it then rolls onward with a real progressive motion by the momentum it has acquired, and breaks into foam and lashes the earth and rocks. The sea billows are sometimes twenty-five feet in elevation,* and when these advance upon a stranded ship on a lee shore, with the speed of a locomotive, their effects are in the highest degree appalling, and iron bolts are snapped and massive timbers crushed beneath their violence.

To prevent the inroads of lake waves upon land, the remedies must vary with circumstances. The difficulty would be small if the water always stood at the same height. The greatest mischief is usually done when they rise over the beach of sand and gravel which they have beaten for centuries. Wooden bulwarks soon decay. Where loose stone can be had in large quantities they may be cheapest; but they are not unfrequently placed too near low-water-mark to protect the banks. Substances which offer a gradual impediment to the waves are often quite effectual, though not formidable in themselves. It is curious to observe how so slender a plant as the bull-rush, growing in water several feet deep, will destroy the force of waves. If it grew only near the shore, where the water has progressive motion, it would soon be dashed in heaps on the beach. Parallel hedge rows of the ozier willow, protected

* No authentic measurement gives the perpendicular height of waves more than twenty-five feet.

Digitized by Google

by a wooden barrier until well-grown and established, would in many cases prove efficient.

Stone and timber bulwarks are often made needlessly liable to injury by being built nearly perpendicular, and the waves break suddenly and with full force, like the blows of a sledge against them. A better form is shown in Fig. 82, where a slope is first presented to weaken their force without imposing a full resistance, and their strength is gradually spent as they rise in a curve. It is on this principle that the stability of the world-renowned Eddystone lighthouse depends. The base spreads out in every direction like the trunk of a tree at the roots; and although the spray is sometimes dashed over its lofty summit by the violence of the storm, it has stood unshaken on its rocky base far out in the sea, against the billows and tempests for nearly a century.

FIG. 82.

[APPENDIX TO HYDROSTATICS AND HYDRAULICS.]

SPECIFIC GRAVITIES.

In connection with Hydrostatics, the subject of the Specific Gravities of bodies should not be omitted. The specific gravity of a substance is its *comparative weight* with some other substance, an equal bulk of each being taken. Water is usually taken as the standard for comparison.

To ascertain the specific gravity, weigh the body both in and out of water, and observe the difference; then divide the whole weight by this difference, and the quotient will be the specific gravity of the body. For example,—if a stone weighs 12 lbs. out of water, and 7 lbs. in water, divide 12 by 5, and the quotient is 2.4—which shows that the stone is $2\frac{4}{10}$ times heavier than water.

When the substance is lighter than water, it is loaded down by a weight, and allowance is made for the load's difference of weight in air and water.

A knowledge of the relative weights of various substances often becomes useful in different ways; a table of some of the more common substances is given below:—

Digitized by Google

Table of Specific Gravities.

Metals.

Gold, pure,	19.36
" standard,	17.16
Mercury,	13.58
Lead,	11.35
Silver,	10.50
Copper,	8.82
Iron,	7.78
Iron, cast,	7.20
Steel,	7.82
Brass, common,	7.82
Tin,	7.29
Zinc,	6.86

Stones and Earths.

Brick,	1.90
Chalk,	2.25 to 2.66
Clay,	1.93
Coal, anthracite, about,	1.53
Coal, bituminous,	1.27
Charcoal,	.44
Earth, loose, about,	1.50
Flint,	2.58
Granite, about,	2.65
Gypsum,	1.87 to 2.17
Limestone,	2.38 to 3.17
Lime, quick,	.80
Marble,	2.56 to 2.69
Peat,	0.60 to 1.32
Salt, common,	2.13
Sand,	1.80
Slate,	2.67

Woods—Dry.

Green wood often loses one-third of its weight by seasoning, and sometimes more. The same kind varies in compactness, with soil, growth, exposure and age of the trees.

Digitized by Google

Apple,	.68 to .79
Ash, white,	.72 to .84
Beech,	.72 to .85
Box,	.91 to 1.32
Cherry,	.71
Cork,	.24
Elm,	.58 to .67
Hickory,	.84 to 1.00
Maple,	.65 to .75
Pine, white,	.47 to .56
" yellow,	.55 to .66
Oak, English,	.93 to 1.17
" white,	.85
" live,	.94 to 1.12
Poplar, Lombardy,	.40
Pear,	.66
Plum,	.78
Sassafras,	.48
Walnut,	.67
Willow,	.58

Miscellaneous.

Beeswax,	.96
Butter,	.94
Honey,	1.45
Lard,	.94
Milk,	1.03
Oil, linseed,	.94
" whale,	.92
" turpentine,	.87
Sea water,	1.02
Sugar,	1.60
Tallow,	.93
Vinegar,	1.01 to 1.08

Digitized by Google

Weights of a cubic foot of various substances.

Cast iron,	450	pounds.
Water,	62	"
White pine, seasoned, about,	30	"
White oak, " "	52	"
Loose earth, about,	95	"
Common soil, compact, about,	124	"
Clay, about,	135	"
Clay with stones, about,	160	"
Brick, about,	125	"

Bulk of a ton of different substances.

23 cubic feet of sand, 18 cubic feet of earth, or 17 cubic feet of clay, make a ton. 18 cubic feet of gravel or earth before digging, make 27 cubic feet when dug; or the bulk is increased as three to two. Therefore, in filling a drain two feet deep above the tile or stones, the earth should be heaped up a foot above the surface, to settle even with it when the earth is shovelled loosely in.

Table showing the amount of water discharged per minute through an orifice one inch in diameter; also through a tube one inch in diameter and two inches long; according to experiment. To ascertain the amount in gallons, divide the cubic inches by 231.

Height of head of water.	Amount discharged through orifice.	Amount discharged through tube.
1 Paris foot.*	2,722 cubic inches.	3,539 cubic inches.
2 "	3,846 "	5,002 "
3 "	4,710 "	6,126 "
4 "	5,436 "	7,070 "
5 "	6,075 "	7,900 "
6 "	6,654 "	8,654 "
7 "	7,183 "	9,340 "
8 "	7,672 "	9,975 "
9 "	8,135 "	10,579 "
10 "	8,574 "	11,151 "
11 "	8,990 "	11,693 "
12 "	9,384 "	12,205 "
13 "	9,764 "	12,699 "
14 "	10,130 "	13,177 "
15 "	10,472 "	13,620 "

*A Paris foot is about 12 4-5 U. S. inches, and 15 Paris feet are about 16 U. S. feet.

Digitized by Google

The following table shows the height of a head of water required to overcome the friction in horizontal pipes 100 feet long, and to produce a certain velocity; according to SMEATON:

BORE OF PIPES.	6 INCHES.	1 FOOT.	1½ FEET.	2 FEET.	3 FEET.	4 FEET.	5 FEET.
½ in.	4.5 in.	16.7 in.	35.1 in.	4 ft. 9.7 in.	10 ft. 1.0 in.	17 ft. 10.0 in.	28 ft. 0.2 in.
¾	3.0	11.1	23.3	3 2.5	6 8.6	11 10.6	18 8.1
1	2.2	8.4	17.5	2 4.9	5 0.5	8 11.0	14 0.0
1¼	1.8	6.7	14.0	1 11.1	4 0.4	7 1.6	11 2.5
1½	1.5	5.6	11.7	1 7.2	3 4.3	5 11.3	9 4.1
1¾	1.3	4.8	10.0	1 4.5	2 10.6	5 1.1	8 0.1
2	1.1	4.2	8.7	1 2.4	2 6.2	4 5.5	7 0.0
2¼	1.0	3.7	7.8	1 0.8	2 9.9	3 11.6	6 2.7
2½	0 9	3.3	7.0	0 11.5	2 0.2	3 6.8	5 7.2
3	0.7	2.8	5.0	0 9.6	1 8.2	2 11.7	4 8.0
3½	0.6	2.4	5.0	0 8.2	1 5.3	2 6.6	4 0.0
4	0.6	2.1	4.4	0 7.2	1 3.1	2 2.7	3 6.0

Look for the velocity of the water per second, in the pipe, in the upper line; and in the column beneath it, and opposite the given diameter of the pipe, is the height of the column or head required to obtain the required velocity.

To find the quantity of water discharged each minute, multiply the velocity by 12, which will give the inches per second; then multiply this product by 60, which will give the inches per minute; then, to change these cylindrical inches into cubic inches, multiply by 4 and divide by 5.* Divide the cubic inches by 231, and the result will be gallons.

By comparing this table with the next preceding, we shall perceive that the water flows from three to four times as fast through the tube two inches long, as through a tube one hundred feet long; the diameter of the tube and the head of water being the same.

Contents of Cisterns.

A simple rule to determine the contents of a cistern, circular in form, and of equal size at top and bottom, is the following: Find the depth and diameter in inches; square the diameter, and multiply the square by the decimal .0034, which will give the quantity in gallons† for one inch in depth. Multiply this by the depth, and

*This gives the cubic inches very nearly; but to be more accurate, multiply by the decimal .7854, which represents the difference between the area of a square and of a circle.

†This is the standard gallon of 231 cubic inches. The gallon of the State of New-York contains 231.184 cubic inches, or 8 pounds at its maximum density

Digitized by Google

divide by 31½, and the result will be the number of barrels the cistern will hold.

For each foot in depth, the number of barrels answering to the different diameters are,

For 5	feet diam.,	.....	4.66	barrels.
6	"	.....	6.71	"
7	"	.....	9.13	"
8	"	.....	11.93	"
9	"	.....	15.10	"
10	"	.....	18.65	"

By the rule above given, the contents of barn-yard cisterns and manure tanks may be easily calculated for any size whatever.

Cisterns, unless adapted in size to the quantity of water they are to receive, occasion a waste, either in the expense of the cistern or of the water. Before constructing one, therefore, the necessary calculation should be made. To furnish a certain supply, it should hold enough to last two months. The average depth of rain which falls in this latitude, although varying considerably with season and locality, may be set down at three feet, and it rarely exceeds seven inches for two months. The size of the cistern, therefore, need never exceed that of a body of water on the whole roof of the building seven inches deep. To ascertain the amount of this, multiply the length by the breadth of the building, reduce this to inches, and divide the product by 231, and the quotient will be gallons for each inch of depth. Multiplying by 7, will give the full amount for two months rain falling upon the roof. Divide by 31½, the quotient will be barrels. This will be about fourteen barrels for every surface of roof ten feet square when measured horizontally. Therefore a cistern for a barn 30 by 40 feet, should hold 168 barrels; that is, as large as one ten feet in diameter and nine feet deep. Such a cistern would supply, with only 30 inches of rain yearly, no less than 630 barrels, or nearly two a day. Many of the cisterns in the country do not save half the water that falls during rainy seasons, and fail in times of drouth.

Digitized by Google

PNEUMATICS.

Pneumatics treats of the mechanical properties of *air*.

The atmosphere which covers the earth, extends upwards to a height of many miles. Although at the earth's surface it is eight hundred times lighter than water, yet from its great height it presses upon the surface of the earth as heavily as a depth of thirty-three feet of water. This is nearly equal to fifteen pounds in every square inch, or more than two thousand pounds to the square foot. This enormous weight would instantly crush us, did not air, like liquids, press in every direction so that the upward exactly counterbalances the downward pressure, and the air within the body counteracts that without.

The weight of the atmosphere is strikingly shown by means of an air-pump, which pumps the air from a glass vessel placed mouth downwards, upon the brass plate of the machine. When the air is pumped out, and the upward or counterbalancing air removed, so heavy is the load upon the glass vessel, that a strong man could scarcely remove it from the plate though it be no larger than a small tumbler. A glass jar with a mouth six inches across would require a force equal to nearly four hundred pounds to remove it. If there be a glass vessel open at both ends, the hand placed on the top may be held so firmly by the pressure, that it cannot be removed until the air is again admitted below. If a thin plate of glass be placed on the top of this open vessel, on pumping out the air, the weight will suddenly crush it with a noise like the report of a gun.

It is the pressure of the atmosphere upon water, that drives it up the barrel of a pump as soon as the air is pumped out from the the inside. Hence the reason that pumps can never be made to draw water more than thirty-three feet below the piston, a height corresponding to the weight of the atmosphere.

On the same principle the *barometer* is made. It consists of a glass tube, nearly three feet long, open at one end, and which is filled with mercury, a liquid nearly fourteen times heavier than water. The open end is placed downwards in a cup of mercury. The weight of the mercury in the tube causes it to descend until the pressure of the atmosphere on the mercury in the cup preserves an equilibrium, which takes place when the column in the

Digitized by Google

tube has fallen to about two feet and a half high, the upper part of the tube being left a perfect vacuum, as no air can enter. Now, as the height of the column of mercury depends alone upon the weight of the atmosphere, then whenever the air becomes lighter or heavier, as it constantly does during the changes of the weather, the rising or falling of the column indicates these changes; and, what is very important, it shows the approaching changes of the weather several hours before they actually take place. Hence, it furnishes the best known mode of foretelling the weather. When the mercury falls, showing that the atmosphere is becoming lighter, it indicates the approach of storms or rain; when it rises, a settled or fair sky follows. These are often foreshown before there is any change in the appearance of the sky. For this reason, the barometer is sometimes called a *weather-glass*. It is of the greatest value to navigators at sea. Long voyages which formerly required a year, have been made in eight months by means of the assistance afforded by the barometer, admitting a full spread of canvass by night as well as by day, from the certainty of its predictions. There is scarcely a doubt that its use would be of eminent advantage in large farming establishments, more especially during the precarious seasons of haying and harvesting.

The barometer is an instrument of great value in determining with little labor, and with considerable accuracy, the heights of mountains, hills, and the leading points of an extensive district of country. In rising above the level of the sea, the weight of the air above us becomes less; that is, the pressure of the air upon the barometer decreases, and the column of mercury gradually falls as we ascend. To determine, therefore, the height of a mountain, we have only to place one barometer at its foot while another stands at the top; and then by observing the difference in the height of the mercury, we are enabled to calculate the height of the mountain. The following table shows how much the barometer falls at different altitudes, thirty inches being taken for the sea level:*

* The mercury rarely stands as high as 30 inches at the level of the sea, the mean height being about 29.5 inches. But this does not affect the measurement of heights, which is determined not by the actual height but only by the *difference* in heights.

Digitized by Google

At 1000	feet	above	the	sea,	the column	falls to 28.91	inches.
2000	"	"	"	"	.....	27.86	"
3000	"	"	"	"	.....	26.85	"
4000	"	"	"	"	.....	25.87	"
5000	"	"	"	"	.....	24.93	"
1 mile		"	"	"	.....	24.67	"
2	"	"	"	"	.....	20.29	"
3	"	"	"	"	.....	16.68	"
4	"	"	"	"	.....	13.72	"
5	"	"	"	"	.....	11.28	"
10	"	"	"	"	.....	4.24	"
15	"	"	"	"	.....	1.60	"
20	"	"	"	"	.....	0.95	"

At the level of the sea, the barometer falls about one hundreth of an inch for a rise of nine feet; or a little more than the tenth of an inch for a rise of one hundred feet. At a height of one mile it requires about eleven feet rise to sink the mercury a hundreth of an inch.

In selecting land in mountainous districts of the country, where degrees of frost increase with increased altitudes, and where the height of one portion above another has an important relation to the cost of drawing loads up and down hill, the barometer might become of much practical value.

FIG. 83.

The *syphon* operates on a principle quite similar to that of the pump. But instead of pumping out the air of the tube through which the water rises, a vacuum is created by the weight of a column of water, in the following way: Fig. 83 represents a syphon, which is nothing more than a tube bent in the form of the letter U inverted. Now, if this be filled throughout with water, and then placed with the shorter arm in the vessel of water, A, the weight of the column of water in the longer arm, which is outside, will overbalance the weight of the other column, and will therefore run out in a stream. This tends to cause a vacuum in the tube, which is instantly filled by the water rushing up the shorter arm, being driven up by the pressure of the atmosphere. A stream will consequently continue running through the syphon, until the vessel is drained.

Digitized by Google

The syphon may sometimes be very usefully employed in emptying pools or ponds of water on high ground, without the trouble of cutting a ditch for this purpose. For instance, let *a*, Fig. 84, represent a body of water which it is desirable to drain off; by placing the lead tube *b c*, so that the arm *c* may be lowest, and applying a pump at this arm to withdraw the air and fill the syphon with water, it will commence running and continue till the water has all been drawn off.

Fig. 84.

Some interesting instances occur in nature of the use of atmospheric pressure. Flies walk on glass by means of the pressure against the outside of their feet, the air having been forced out beneath. In a similar way, some kinds of fishes cling to the sides of rocks under water, so as not to be swept off by the current. Dr. Shaw threw a fish of this kind into a pail of water, and it fixed itself so firmly to the bottom, that by taking hold of the tail he lifted up the pail, water and all.

Winds.

Wind is air in motion. Its force depends on its speed. When its motion is slow, it constitutes the soft gentle breeze. As the velocity increases, the force becomes greater, and the strong gale sweeps round the arms of the windmill with the strength of many horses, and huge ships are driven swiftly through the waves by its pressure. By a still greater velocity of the air, its power becomes more irresistible, and solid buildings totter, and forest trees are torn up by the roots, in the track of the tornado.

The force of wind increases directly as the square of the velocity. Thus a wind blowing ten miles an hour exerts a pressure four times as great as at five miles an hour, and twenty-five times as great as at two miles an hour. The following table exhibits the force of wind at different degrees of velocity:

Miles an hour.	Pressure in lbs. on a square foot.	Description.
1	.005	Hardly perceptible.
2	.020	Just perceptible.
3	.045	
4	.080	Light breeze.
5	.125	

Digitized by Google

Miles an hour.	Pressure in lbs. on a square foot.	Description.
6	.180	Gentle pleasant wind.
7	.320	
10	.500	Pleasant brisk wind.
15	1.125	
20	2.000	Very brisk.
25	3.125	
30	4.500	Strong high wind.
35	6.125	
40	8.000	Very high.
45	10.125	
50	12.500	Storm or tempest.
60	18.000	Great storm.
80	32.000	Hurricane.
100	50.000	Tornado, tearing up trees, and sweeping off buildings.

These forces may be observed at a time when the air is still, by a forward motion equal to that of the wind. Thus, walking moderately gives the faint breeze against the face; riding in a wagon at six miles an hour causes the sensation of a pleasant wind; the deck of a steamboat at fifteen miles produces a brisk blow; while an open rail car at forty miles an hour occasions a sweep of the air nearly resembling a tempest.

The preceding table will enable any one to calculate with considerable accuracy, the power possessed by the sails of a windmill whose size is known, first deducting the speed of the sails. The amount of draught which a horse must constantly overcome in travelling with a covered carriage against the wind may likewise be readily determined, adding of course the speed of the horse to the velocity of the wind.

The motion of air in producing wind is explained by the action of heat, although there are many irregular currents whose cause is not well understood. The simplest illustration of the effect of heat in causing currents, is furnished by the land and sea breezes in warm latitudes. The rays of the sun during day, heat the surface of the land, and the air in contact with it also becoming heated, and thus rendered lighter, flows upward; the air from the sea rushes in to fill the vacancy and causes the sea breeze. During the night, the radiation of heat from the land into the clear sky above, cools

Digitized by Google

the surface to a lower temperature than that of the sea; consequently the air in contact with the sea becomes heated the most, and rising, causes the wind from the land to flow in and supply the place. Trade winds are caused in a similar way, but on a much larger scale, by the greater heat of the earth at the equator, which produces currents from colder latitudes. These currents assume a westerly tendency, in consequence of the velocity of the earth being the greatest at the equator, and which outstripping the momentum which the winds have acquired in other latitudes, tends to throw them behind or in a westerly direction.

Chimney-currents are produced by the heat of the fire rarifying the air, which rises and carries the smoke with it. The taller the chimney is, the longer will be the column of rarified air tending upwards, and as a consequence the stronger will be the draught. In kindling a fire in a cold chimney, there is very little current till this column becomes heated. The upward motion of heated currents is governed by laws similar to the downward motion of water in tubes, where the velocity is increased with the height of the head. But as air is more than eight hundred times lighter than water, slight causes will affect its currents, which would have no sensible influence on the motion of liquids. For instance, a strong wind striking the top of a chimney may send the smoke downwards into the room; and a current cannot be induced through a horizontal pipe without connecting with it an upright pipe of considerable height.

In constructing chimneys to produce a strong draught, the throat immediately above the fire, which should have a breadth equal to that of the fire place, should be contracted to a width of about four inches, so that the column of rising air above may draw the air up through the throat with an increased velocity, Fig. 85. This arrangement also allows the fire to be built so as to throw the heat more fully out into the room. By leaving the shoulder at *b* square or flat, it will tend to arrest any reversed or downward current in a better manner than if built sloping, as shown by the dotted lines at *a*, which would act like a funnel and throw the smoke into the room. The throat should be about

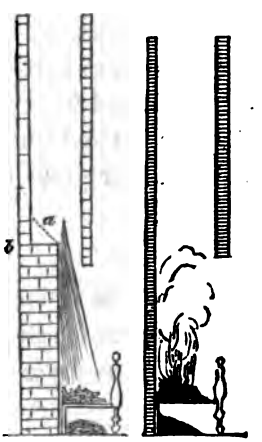


Fig. 85. Fig. 86.

Digitized by Google

as high as the extreme tip of the flame; if much higher, the chimney will not draw so well, and if lower, too much of the heat will be lost. Fig. 86, shows a fire place without a contracted throat, the current of which is comparatively feeble. Many chimneys draw badly by being made too large for the fire to heat sufficiently the column of air they contain.

When wind sweeps over the roof of a high part of the building, or over a hill, it often strikes the top of chimneys below, and drives the smoke downwards. This may be often prevented by placing a cap over the chimney, like that represented by Fig. 87, which is supported at its corners, the smoke passing out at the four sides just under the eaves of this cap. But it sometimes happens that there is a confusion of currents and eddies at the top of the chimney, over which this cap has no influence. In this case, the cap represented by Fig. 88, furnishes a perfect remedy, and is indeed the best under any circumstances whatever, for the chimney surmounted by it will always draw when there is wind from any quarter, with or without any fire. It has effected a perfect cure in some chimneys which before were exceedingly troublesome, and were regarded as incurable. Fig. 89, is intended to show the mode of its operation, the wind as shown by the arrows, being deflected for a considerable distance on the lee side, so as to form a vacancy at *a*, which the wind from the other end and from the chimney both rush in to supply. Being fixed on without turning in the chimney, it is both simpler and less noisy than any caps furnished with a vane.

FIG. 87.

FIG. 88.

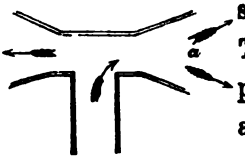


FIG. 89.

MOVING POWERS.

Most of the moving powers applied by the farmer to accomplish labor, are the exertions of animal strength. A principal object of the preceding pages is to point out how this strength can be applied in the most economical manner, and to aid in the substitution of cheap horse-power for more costly human labor. It will doubtless

Digitized by Google

contribute to the end, to exhibit the relative efficiency of each, as well as the results of strength differently applied.

The amount of work which any machine is capable of performing, is denoted by comparing this amount with the power of a single horse; hence the common expressions of twenty, or fifty, or a hundred horse-power engines. The strength of different horses varies greatly, but the expression as commonly understood indicates a force equivalent to raising or moving 150 pounds 20 miles a day at the rate of two and a half miles an hour. This is the same as 33,000 pounds raised one foot in one minute. The results of numerous experiments in different places give the actual power of the average of horses at somewhat less than this; and there is no doubt that for most of the farm-horses of this country, the result would be considerably less. The power of a strong English draught-horse has been ascertained to be about 143 pounds for 22 miles a day, at 2¾ miles an hour. Many American horses are scarcely more than half as strong. The strength of a man, working at the best advantage, is estimated at one-fifth that of a horse. As the speed of a horse increases, his strength of draught diminishes very rapidly, till at last he can only move his own weight. This is owing to three reasons; first, the load moves over a greater space in a given time, and if, for instance, the speed be doubled, half the load only can be carried with the same quantity of power, according to the law of virtual velocities; secondly, the horse has to carry the full weight of his body, whatever his speed may be, and the force expended for this purpose alone must therefore be doubled as the speed is doubled; thirdly, a very quick and unaccustomed motion of the muscles is in itself more fatiguing than the ordinary or natural velocity.

The following table shows the amount of labor a horse of average strength is capable of performing in a day at different degrees of speed, on canals, railroads, and on turnpikes. The force of draught is estimated at about 83 pounds. This is considerably less than the horse-power used in estimating the force of machinery, but is as much as an ordinary horse can exert without being improperly fatigued with continued service:

Digitized by Google

VELOCITY PER HOUR.	DURATION OF THE DAY'S WORK.	WORK ACCOMPLISHED FOR ONE DAY, IN TONS, DRAWN ONE MILE.		
Miles.	Hours.	On a canal.	On a railroad.	On a turnpike.
$2\frac{1}{2}$	$11\frac{1}{2}$	520	115	14
3	8	243	92	12
$3\frac{1}{2}$	$5\frac{9}{17}$	153	82	10
4	$4\frac{1}{2}$	102	72	9
5	$2\frac{9}{17}$	52	57	7.2
6	2	30	48	6
7	$1\frac{1}{2}$	19	41	5.1
8	$1\frac{1}{8}$	12.8	36	4.5
9	$\frac{9}{17}$	9	32	4
10	$\frac{3}{4}$	6.6	28.8	3.6

From the preceding table it will be seen that a horse at a moderate walk will do more than four times as much work on a canal as on a railroad. But the resistance of the water increases as the square of the velocity, and therefore when the speed reaches five miles an hour, the railroad has the advantage of the canal. On the railroad and turnpike, the resistance is about the same, whether the speed be great or little, the chief loss with fast driving resulting from the increased difficulty with which the horse carries forward his own body, which weighs from 800 to 1,200 pounds. The table also shows that when it becomes necessary to drive rapidly with a load it should be continued but for a very short space of time, for a horse becomes as much fatigued in an hour, when drawing hard at ten miles an hour, as in twelve hours at two and a half miles an hour. Because, when a boat is driven through the water, to double its velocity not only requires that twice the amount of water should be moved or displaced in a given time, but it must be moved with twice the velocity, thus requiring a four-fold force.

The muscular formation of a horse is such, that he will exert a considerably greater force when working horizontally, than up a steep inclined plane. On a level a horse is as strong as five men, but up a steep hill he is less strong than three; for three men, carrying each 100 pounds, will ascend faster than a horse with 300 pounds. Hence the obvious waste of power in placing horses on steeply inclined tread-wheels or aprons. The better mode is to allow them to exert their force nearly horizontally, by being attached to a fixed portion of the machine. For the same reason the common

Digitized by Google

opinion is erroneous, that a horse can draw with less fatigue on an undulating than on a level road, by the alternations of ascent and descent calling different muscles into play, and relieving each in turn. For the same muscles are alike exerted on a level and on an ascent; only, in the latter case the fatigue is much greater than the counterbalancing relief. Any person may convince himself of the truth on this subject by first using a loaded wheelbarrow or hand-cart for one day on a level, and for the next up and down a hill; bearing in mind at the same time that the human body is better fitted for climbing and descending than that of a horse.

A *draught horse* can draw 1,600 pounds 23 miles in a day, on a good common road, the weight of the carriage included. On a plank road he will draw more than twice as much.

man of ordinary strength exerts a force of 30 pounds for ten hours a day, with a velocity of 2½ feet per second. He travels, without a load, on level ground, during 8½ hours a day, at the rate of 3.7 miles an hour, or 31¼ miles a day. He can carry 111 pounds eleven miles a day. He can carry in a wheelbarrow 150 pound ten miles a day.

Well constructed machines for saving human labor by means of horse labor, when encumbered with little friction, will be found to do about *five times* as much work for each horse, as where the same work is performed by men. For example,—an active man will saw twice each stick of a cord of wood in a day. Six horses with a circular saw, driven by means of a good horse power, will saw five times six or thirty cords working the same length of time. In this case the loss by friction is about equal to the additional force of attendance on the machine.

Again,—a man will cut with a cradle two and a half acres of wheat in a day. A two-horse reaper should therefore cut, at the same rate, ten times two and a half, or twenty-five acres. This has not yet been accomplished; we may therefore infer that the machinery for reaping has been less perfected than for sawing wood. It should however be remembered that great force is exerted and for many hours in a day, in cutting wheat with a cradle; and therefore a little less than twenty-five acres a day may be regarded as the maximum attainment of good reaping machines, when they shall become perfected.

Digitized by Google

Applying the same mode of estimate, a horse-cultivator will do the work of five men with hoes, and a two-horse plow the work of ten men with spades. A horse-rake accomplishes more than five men, because human force is not strongly exerted with the hand-rake.

In using different tools, the degree of force or pressure applied to them varies greatly with the mode in which the muscles are exerted. The following table gives the results of experiments with human strength, variously applied, for a short period:

	Force of the hands on the tool.	Force of the tool on the object.
With a drawing knife, ...	100 lbs.	100 lbs.
a large auger, both hands,.....	100	about 800
a screw driver, one hand,.....	84	250
a bench vice, handle,.....	72	about 1000
a windlass, with one hand,.....	60	180 to 700
a hand-saw,.....	36	36
a brace-bit, revolving,.....	16	150 to 700
Twisting with thumb and fingers, button screw, or small screw driver,.....	14	14 to 70

The force given in the last column will of course vary with the degree of leverage applied; for example, the arms of an auger, when of a given length, act with a greater increase of power with a small size than with a large one. This degree of power may be calculated for an auger of any size, by considering the arms as a lever, the centre screw the fulcrum, and the cutting blade as the weight to be moved. The same mode of estimate will apply to the vice-handle, the windlass, and the brace-bit.

Every one is aware that a heavy weight, as a pail of water, is easily lifted when the arm is extended downwards, but with extreme difficulty when thrown out horizontally. In the latter case, the pail acts with a powerful leverage on the elbow and shoulder joint. For this reason all kinds of hand labor, with the arms pulling or pushing directly from the shoulders, are most easily performed; while a motion sidewise or at right angles to the arm is far less effective. Hence great strength is applied in rowing a boat, or in using a drawing knife; and but little strength in turning a brace-bit, or working a dasher-churn. Hence, too, the reason that in turning a grindstone, the pulling and thrusting part of the mo-

Digitized by Google

tion is more powerful than that through the other parts of the revolution. This also explains why two men, working at right angles to each other on a windlass, can raise seventy pounds more easily than one man can raise thirty pounds alone. This principle should be well understood in the construction or selection of all kinds of machines for hand labor.

The Force of Heat.

It sometimes happens that a powerful force is needed for a very short distance only. There are some slowly acting agencies in nature which possess extraordinary power. Among these *heat* is conspicuous. A familiar instance occurs in the manner in which the parts of carriage wheels are bound together. The tire is made a little smaller than the wooden part of the wheel; it is then heated till by expanding it becomes large enough to be put on, when it is suddenly cooled with water, and by its powerful contraction binds every part of the wheel together with great force. Hogsheads are firmly hooped with iron bands in the same way, with more force than could be ever given by driving on with the blows of the mallet.

This principle was very ingeniously applied in drawing together two expanding brick walls of a large building in Paris, which threatened to burst and fall. Holes were drilled in the opposite walls, through which strong iron bars across the building projected, and circular plates of iron were screwed on these projecting ends. The bars were then heated, which increased their length; the plates were then screwed closely against the walls. On cooling they contracted, and drew the walls nearer together. The process was repeated on alternating bars, until the walls were restored to their perpendicular position.

All tools, where the wooden handles enter iron sockets, will hold more firmly if the metal is heated before inserting the wood.

The metallic parts of pumps sometimes become very difficult to unscrew, and cases have occurred where two strong men could not start the screws, until a bystander suggested that the outer piece be heated, keeping the inner cool; when a force of less than ten pounds quickly separated them. In other cases, where the large iron nuts have been thoughtlessly screwed, while warmed with the hands, on the cold metallic axles of woodsawing machines

Digitized by Google

in winter, they have contracted so that the force of two or three men has been insufficient to turn them.

The sudden expansion of bodies by heat sometimes causes accidents. Thick glass vessels when unequally heated, expand unequally, and break. Heated plates of cast iron or cast kettles, are very liable to be fractured by suddenly pouring cold water upon them. The same effect has been usefully applied in splitting the scattered rocks which encumber a farm, and which are too large to remove while entire. Fires are built upon them, the upper surface expands while the lower remains cold and large portions are successively separated in scales, and sometimes the whole rock is severed. The only care needed is to observe attentively and remove with an iron bar any parts which may have become loosened by the heat, and which would prevent the heat from passing to other portions. One man will thus attend to a large number of fires, and will split in pieces ten times as many rocks in a day as by drilling and blasting.

A striking exception to the general law of expansion by heat occurs in the freezing of water.* During its change to a solid state, it increases in bulk about one-twelfth, and this expansion is accompanied with a great force. The bottoms of barrels are burst out, and cast-iron kettles are split asunder, when water is suffered wholly to freeze in them. Lead pipes filled with ice, expand; but if it is often repeated, they are cracked into fissures. A strong brass globe, the cavity of which was only one inch in diameter, was used by the Florentine academicians, for the purpose of trying the expansive force of freezing water, by which it was burst, although the force required was calculated to be equal to *fourteen tons*. Experiments were tried at Quebec, in one of which an iron plug, nearly three pounds in weight, was thrown from a bomb-shell to the distance of 415 feet; and in another, the shell was burst by the freezing of the water which it contained.

This expansion has a most important influence in the pulverization of soils. The water which exists through all their minute portions, by conversion to frost, crowds the particles asunder, and when thawing takes place, the whole mass is more completely mellowed than could possibly be effected by the most perfect instru-

* There are a very few other substances which expand on passing from a liquid to a solid state.

Digitized by Google

ment. This mellowing is however of only short duration, if the ground has not been well drained to prevent its becoming again packed hard by soaking with water.

But this is not the most important result from the expansion of water. Much of the existing order of nature and of civilized life depends upon this property; without it the great mass of our lakes and rivers would become converted into solid ice. For, as soon as the surface became covered, it would sink to the bottom, beyond the reach of the summer's sun, and successive portions being thus added, the great body of all large rivers and lakes would become permanently frozen. But instead of this disastrous consequence, the ice by resting upon the surface, forms an effectual screen from the cold winds to the water below. Thus, what appears at first sight an almost accidental exception, furnishes one out of an innumerable assemblage of proofs of creative wisdom, in fitting the earth for the comfort and sustenance of its inhabitants.

Digitized by Google

ANALYSES OF THE ROCK, SOILS, SAND, PEAT AND WATERS OF A FARM OWNED BY DR. JOHN A. PAINE.

BY J. H. SALISBURY, M. D.

This farm is situated in the town of New-Hartford, Oneida co., N. Y. It lies north of the Chenango canal, and also north of the plank road that leads from Utica to Clinton; and five miles west southwest of Utica, in the valley of one of the tributaries of the Sauquoit creek, by which tributary it is watered. The surrounding country is undulating and inclined to the north towards the Mohawk Valley.

The farm contains ninety-three acres; has been in the possession of Dr. Paine only one year. In other hands it has been tilled for about fifty years in the culture of wheat, corn, oats, and grass. Has been a good grain-growing farm. Common barn-yard manure is the principal manure that has been applied. The original timber was principally a large growth of maple and beech, with a few hemlocks. It is designed now to convert the place mainly to the purpose of fruit-growing.

Height above tide water, five hundred feet.

Mean temperature for the year 1850, 45.68.

General course of winds, west.

Mean depth of rain, forty-one inches.

Length of vegetating season, five months.

Mean temperature of five growing months, 62°.

Latitude 43° 2′; longitude 75° 16′. West time from Greenwich, 5h. 0′ 53″. From Washington 387 miles.

The farm rests immediately upon the upper portion of the Hudson River group. Only a small part of the soil, however, is made up of this rock. The greater portion of it is composed of drift materials from the lower rocks which crop out north of it. Bould-

Digitized by Google

ers of granite, gneiss, Potsdam sandstone, calciferous sandrock, Black River and Trenton limestones, Utica slate, and the lower portion of the Hudson River slate, appear in angular and worn fragments scattered over the farm, and everywhere through the soil. On examining the finer portions of the soil under the microscope, the greater part of it is found to be composed of the same materials as the boulders. As a general rule, silicious matter predominates. The orchard soil contains more of the rock on which it rests than either of the others.

Composition of the Rock which underlies the farm.

One hundred parts of the dry rock gave of

Silica,	81.01
Alumina,	7.02
Iron, peroxide,	8.03
Manganese,	0.18
Phosphoric acid,	trace.
Lime,	1.57
Magnesia,	0.35
Potash,	0.73
Soda,	0.19
Chlorine,	none.
Sulphuric acid,	trace.
Organic matter,	0.38
	99.46

This rock in composition does not so much class itself with those which by their decomposition form a soil that is well adapted to the growth of wheat and corn, as among those which form one adapted to the production of grass, roots and trees. The fertility of the soil of the farm is more owing to the transported materials than to those derived from the rock on which it rests.

Composition of the uncultivated Forest soil.

On examining it under the microscope it was found to be composed mostly of quartz sand, hornblende, feldspar, mica and vegetable matter mixed with a small quantity of the disintegrated underlying slate.

Digitized by Google

One hundred parts of soil saturated with moisture lost on drying, 40.975 per cent. of water. One hundred parts of dry soil gave of

Humic acid,	1.610
Humine,	0.912
Apocrenic acid,	0.043
Crenic acid,	0.028
Humus and undecayed vegetable matter,	11.047
Silica,	77.002
Alumina and iron,	6.750
Phosphoric acid,	0.005
Lime,	0.725
Magnesia,	0.240
Potash,	0.316
Soda,	0.194
Chlorine,	trace.
Sulphuric acid,	trace.
	99.903*

This soil contains a large percentage of organic matter, which accounts for its high absorbing power. Although not rich in phosphoric acid, potash and soda, yet it contains enough of these bodies to supply the demands of several crops. The aggregate amount of each of them on the area of an acre to the depth of a foot, will be given farther on.

Cultivated soil north of Ditch.

On examining this soil under the microscope, it was found to be composed mostly of drift materials, such as sandstone, quartz sand, granite, hornblende and feldspar, mixed with a small quantity of the disintegrated under-lying slate and organic matter.

One hundred parts of soil, saturated with moisture, gave, on drying 34 per cent. of water.

* I am indebted to Prof. W. F. Phelps, of the State Normal School, who has been prosecuting the study of analytical chemistry in the laboratory for the last six months, for several results in these analyses.

Digitized by Google

One hundred parts of dry soil gave, of

Humic acid, Humine,	1.014
Apocrenic acid,	0.018
Crenic acid,	0.013
Humus and undecayed vegetable matter,	6.844
Silica,	83.502
Alumina and peroxide of iron,	7.450
Phosphoric acid,	0.003
Lime,	0.425
Magnesia,	0.136
Potash,	0.210
Soda,	0.103
Chlorine,	trace.
Sulphuric acid,	trace.
	99.718

Cultivated Orchard soil.

On examining this soil under the microscope, it was found to be made up of the disintegrated under-lying slate mixed with drift materials, such as pieces of granite, quartz sand, fragments of sandstone, hornblende, feldspar, mica and organic matter.

One hundred parts of soil, saturated with moisture, gave, of water, 37 per cent. The absorbing power of this soil, as is seen, is less than that from the forest, and greater than that from north of the ditch. This is precisely what would be indicated by the analyses.

One hundred parts of dry soil gave, of

Humic acid, Humine,	1.201
Apocrenic acid,	0.021
Crenic acid,	0.016
Humus and undecayed vegetable matter,	6.982
Silica,	83.560
Alumina and peroxide of iron,	6.750
Phosphoric acid,	0.005
Lime,	0.113

Digitized by Google

Magnesia,	0.073
Potash,	0.274
Soda,	0.102
Chlorine,	trace.
Sulphuric acid,	0.035
	99.132

The average specific gravity of the soils of the farm is a little over 1.6. At this rate the whole weight of the soil on the area of an acre to the depth of one foot, is 4,356,000 pounds. The 4,356,000 pounds of each of the varieties of soil analysed contain severally, according to the analyses, the following bodies in the proportions given below:

	SURFACE SOIL TO THE DEPTH OF ONE FOOT.		
	Forest soil.	Soil north of ditch.	Orchard soil.
Humic acid,	74,931 lbs.	43,596 lbs.	53,304 lbs.
Humine,	39,826		
Apocrenic acid,	1,873	783	914
Crenic acide,	1,070	580	696
Undecay'd veg. matter and humus,	504,940	262,427	310,077
Silica,	3,374,120	3,687,260	3,669,840
Alum. & pr. ox. of iron	293,400	323,495	294,885
Phosphoric acid,	218	131	218
Lime,	31,661	18,275	4,915
Magnesia,	10,894	5,796	3,175
Potash,	14,524	9,137	11,958
Soda,	8,713	4,480	4,487
Chlorine,	20	20	20
Sulphuric acid,	20	20	1,523

Sand under-lying the Peat.

On examining this under the microscope, it was found to be made up of quartz sand, feldspar, hornblende, mica, and a small quantity of disintegrated slate rock and organic matter.

One hundred parts saturated with moisture, gave, on drying, 24.75 per cent. of water.

Digitized by Google

One hundred parts of dry sand gave, of

Organic matter,	3.857
Silica,	82.500
Alumina and peroxide of iron,	8.750
Phosphoric acid,	0.001
Lime,	1.840
Magnesia,	0.211
Potash,	0.562
Soda,	0.437
Chlorine,	trace.
Sulphuric acid,	0.011
	98.169

Composition of Peat.

One hundred parts, saturated with moisture, gave, on drying, 75.77 per cent. of water.

One hundred parts of dry peat gave, of

Humic acid and Humine,	5.94
Apocrenic acid,	1.47
Crenic acid,	1.03
Resinous matter,	3.82
Humus and undecayed vegetable matter,	76.42
Whole amount of organic matter	88.58
" inorganic matter,	11.42
	100.00

One hundred parts of inorganic matter gave, of

Silica,	53.74
Lime,	24.67
Magnesia,	2.38
Peroxide of iron,	6.95
Alumina,	4.36
Phosphoric acid,	4.69
Potash,	1.92
Soda,	0.73

Digitized by Google

Chlorine,.....	0.17
Sulphuric acid, ...	6.22
	99.73

One main objection to the use of peat as a manure, is its slow decomposition. This can, to a great extent, be remedied by adding to it lime and ashes, or either alone. All peat contains a considerable amount of resinous matter; this is the body which shields it from the effectual action of the ordinary agents of decomposition. By the addition of lime and ashes, this resinous matter combines with these alkaline bases, and forms a soluble soap. The peat now being deprived of resinous matter becomes permeable to moisture and air, and yields more readily to the ordinary laws of decay.

In the soils analysed, although there is enough in each of them of all the ingredients which enter into the plant to supply a number of crops, yet several of them exist already in so small proportion, that it becomes necessary, if the fertility of the soil is preserved, to add as much to them yearly as will be required to supply the demands of the crop raised. If the soil is wished to be improved, from year to year, more must be added. Plaster, lime, the bitterns of salt works, bones and ashes, each in small quantity mixed with the peat of the farm and the products of the barn yard, would make for it a most appropriate and valuable manure.

It may be well here to state the object of the microscopical examination of the soils. This examination was to determine the kind of minerals and rocks which enter into their formation. The minerals and rocks detected in each soil are mentioned in connection with its analysis. The composition of most simple minerals is known. Granite and gneiss are composed principally of feldspar, hornblende, mica, and quartz. Feldspar furnishes to the soil silica, alumina, iron, lime, magnesia, potash and soda. Hornblende furnishes silica, alumina, iron, lime, magnesia and manganese. Mica furnishes silica, alumina, iron, potash and manganese. Quartz furnishes principally silica. Common limestone, lime and carbonic acid. Hydraulic limestone, lime, magnesia, silica, potash and soda, and carbonic acid. Sandstone is mostly silica, it furnishes some alumina, iron, lime, magnesia, potash and soda. The slate rocks

Digitized by Google

contain generally, besides the above materials, a small quantity of phosphoric and sulphuric acids and chlorine. Hence we see that a knowledge of the minerals and rocks which make up a soil, enables us to judge somewhat of its character, composition and durability.

Amount and composition of the Solid matter in the Water of the farm.

	AMOUNT IN ONE GALLON.			
	West drain.	East drain.	Culvert drain.	East well.
Solid matter,.....	12.96 grs.	22.80 grs.	21.36 grs.	19.36 grs.
This contained, of				
Organic matter,..	5.76	6.64	9.12	6.40
Inorganic matter,	7.20	16.16	12.24	12.96
The inorganic matter contained, of				
Silica, ...	0.96	0.81	0.88	0.96
Iron, peroxide,...	1.14	0.48	0.55	0.63
Phosphoric acid,..	0.01	0.02	0.02	trace
Lime, ...	3.39	10.32	6.46	7.02
Magnesia,.....	0.33	0.04	0.16	0.03
Potash, ...	0.88	2.08	1.74	2.08
Soda,.....	0.40	2.24	2.30	2.04
Chlorine,.....	trace.	0.16	0.15	0.16
Sulphuric acid,...	0.04	0.03	0.02	0.02
Inorganic matter,.	7.16	16.18	12.28	12.94

This examination was thought to be interesting and valuable in the way of showing what these waters hold in solution, and hence what they are continually carrying away from the farm, depositing on it from some other, or transporting over it to enrich some place more remote.

It is well known to every farmer who has land which is overflowed annually by a running stream, that this overflowing answers all the purposes of a coating of manure. The rank vegetation which springs up even among the washed pebbles by the stream side, where apparently, barrenness alone would hold its sway, is familiar to all. By what is this fertility caused? Certainly it cannot be caused by pure water. Does then the water hold in solution anything which would impart this richness? In answer it can most confi-

Digitized by Google

dently be said that it does; and the ingredients which it contains, as will be seen by referring to the analyses, are the very bodies upon which plants feed; and what is more, they are in a soluble form, which places them directly at the disposition of the plant.

Digitized by Google

THE REGENERATION OF THE POTATO—ITS POSSIBILITY AND MODE.

BY C. E. GOODRICH, UTICA.

Considering the widespread disease of the potato, any facts that seem to prove its susceptibility of regeneration, and to indicate the mode, must be interesting, even though they should fall short of complete success. Should such a result be ultimately attained, it probably will involve the labor of six or eight years. The sooner then it is set about, and the more persons there are who shall engage in it, the better. Probably there are now numerous experiments in progress; and some of them, it may be, much more successful progress than these which I am about to detail. But in my ignorance of facts, in this supposed case, I wish to make public the progress of my own experiments. The general mode of such experiments I have indicated in two essays on the potato disease, which may be found in the volumes of the "Transactions of the Society," for 1847 and 1848.

1st. *Potatoes from Bogota, in New-Grenada.*

A gentleman from this city, while travelling in New-Grenada, sent, in the spring of 1848, three tubers to his brother here. They were planted in a rich clay soil, not the best for its acclimation to the length of our season. They grew with great vigor, and when killed by the frost, Sept. 27th, were still flowering, having previously yielded twenty-five ripe seed-balls, besides numbers more that were lost. The tubers were numerous, small, black, watery, and uneatable. Both the seed-balls, and a portion of the tubers came into my possession. In the spring of 1849, these tubers were planted in a dry, hot position, but were neglected, through the pressure of other business, especially as the great object of their culture, that of getting seed from them, had already been accom-

Digitized by Google

plished. In the spring of the present year they were planted with more care. They passed through the ordinary alternations of weather, which diseased all our old home varieties, without injury, and were finally killed by the frost, October 15th, having passed through three considerable frosts, (on the 30th of Sept., and the 7th and 8th of Oct.,) without being entirely destroyed. The peculiar influence of the hot and wet weather, that occurred from July 14th to Aug. 21st, had a visible, though slight effect upon them, while it fatally diseased all our ordinary varieties. Here we have a potato, from the native land of that plant, stronger, beyond all comparison, both in foliage and tubers, than any of our native varieties. But its tubers are, in our climate, small and watery, and its season of growth quite too protracted. Besides, it has been liable, every season, to the attack of a very small black flea, which often completely riddles its leaves, and seriously impedes its growth. Whether this liability arises from some sapid quality of its leaves, or some mechanical tenderness of its fibre, I know not. This then is not the potato which we want. It bore seed this year abundantly, when almost nothing else of the kind did; although its seed-balls did not set until after the hot and wet weather of July and August was past, so that they were very late in ripening.

2d. *Bogota Seedlings of* 1849. a. *Culture in* 1849.

The seed-balls, produced by the preceding in 1848, were sown April 28th, and May 2d, partly in hot beds and partly in cold beds. Where the hot beds were covered with glass nearly every seed failed to germinate, except a few on the front side and ends of the bed, where the position was cool and shaded. And yet the tomato and egg-plant, though of the same genus with the potato, and also the melon and the squash, luxuriate in the hotest position usually found in hot-beds. Here then is another proof of the position taken in the essays in the State Transactions, already referred to, that *our climate is too hot and bright to answer the normal requirements of the potato.* Those seeds sown under cotton canvass, whether in hot or cold beds, came up finely. These plants were transferred to the open ground, July 19th, in the midst of a long and hot drought, and when they were quite too large, the pressure of business having forced me to neglect them. They were kept alive with great diffi-

Digitized by Google

culty, until they could take root again. During the autumn many of them flowered, but did not bear seed-balls. Although the season was one of disease, and the treatment of these plants had been very unfavorable, I saw but two or three wilted leaves on the whole 140 hills. They grew until killed by the frost, October 2d, and were dug immediately.

Considering the unfavorable circumstances of their summer's culture, but particularly the protracted season of growth of this variety, it was not surprising that even small tubers were found on less than half of these hills. They were black, red and white, and all sound. Their habit of growth, like that of the parents, was long and procumbent, and the tubers that were black were frequently pointed at each end, and strangely confounded with the stolons so as almost to be homogeneous with them. Those that were white and red were common shapes, and were attached to the stolons in the usual manner. These seedlings exhibited the same liability to the attack of the black flea as their progenitors.

They were, as may well be supposed, very small, varying usually from the size of marrowfat peas to that of marbles.

b. *Their Culture in* 1850.

These tubers, after having been preserved in sand during the winter, were carefully planted, May 2d, in about 160 hills, in a fine gravelly loam, of moderate strength, where corn had been grown in 1849, on inverted green sward. It proved to be greatly infested by the blue corn-worm, which destroyed during the summer about one-fourth of these potatoes, reducing the whole to 120 hills.

As soon as they appeared above ground they were attacked by their old enemy, the black flea, which was repelled by sprinkling them with strong ashes and plaster of Paris. During the middle of the summer eight or ten hills presented slight indications of the wilted leaf, but no blue tips or iron-rust stains upon the leaves. They flowered profusely and continuously all summer long, the flowers being uniformly deep blue, with much larger foot-stalks than any ordinary kinds. No seed-balls set, however, until after the wet and hot weather of July and August was past—weather which destroyed the herbage of all common varieties, and fatally diseased their tubers. That unfavorable season mildewed the leaves

Digitized by Google

of this potato, in some degree, but not a hill died. *On the return of better weather, seed-balls set plentifully, but too late to ripen. Where the verdure had been blackened by the mildew, the naked stems put out a thick growth of young branches, often through their whole length, the plant, at the same time, increasing its length by growing at the top.* They continued green until injured by the frost, September 30th, when, although the foliage was not dead, they were dry. The fruit had set so late that it fell off without ripening, amid the damp chills of September. The preceding proofs of hardiness will, I think, strike every one as being quite remarkable.

You will inquire, with interest, after the tubers grown by plants of such unusual vigor. Let it be remembered that these are almost as late in maturity as their parents; that it was ascertained late in the summer, that they had but just *begun* to set, although ordinary sorts had then nearly completed their growth, as far as disease would permit; that whatever tubers did grow were the result of weather almost constantly dark, wet and cold, occurring from August 23d to October 1st, and succeeding that which had been wet and hot, and that when actually dug, September 13th and October 1st, about ten hills were destitute of tubers, and as many more presented tubers too small to be saved. Let these facts be borne in mind to qualify expectations of a result highly favorable. In weather, such as I have stated, elaboration could not be as healthful as earlier in the season. Those who have noticed the progress of late planted sweet corn, cucumbers for pickles, tomatoes, melons and squashes, know well that the fruit and seeds of these tropicals are never healthful when gathered in the extreme limits of autumn. And although the potato is hardier than any of the foregoing, and will *complete* the growth of the whole season safely, amid very cool autumnal weather, yet it were too much to expect that it should *begin* the growth of tubers healthfully amid such weather, while its depositions are immature and the skin of the young tuber very tender.

The potato usually sets from the 20th of June to the 1st of July, and often finishes its growth by September 1st.

Accordingly, when these potatoes were dug, a portion of them were found diseased. The half dug, September 13th, were not sorted; the other, dug October 1st, contained, as nearly as could be ascertained, ninety-seven varieties, of which thirty-six were red,

Digitized by Google

thirty black, and eighteen white, besides thirteen (of various colors) which were thrown away, because small and ill-shaped.

Had the first digging been sorted before they were stored, they would probably have presented as many more varieties. These altogether would have amounted to nearly two hundred. Out of this whole number, fourteen varieties were found diseased, rarely if ever, however, to the extent of more than one or two in a hill. Here then we have about *seven per cent.* of the *varieties* diseased, but, counting the tubers themselves, probably not more than *one per cent of the whole quantity.* Had this result been found in a crop consisting of only one variety, it would not have been deemed discouraging, but, when it is considered that it was among nearly two hundred apparent varieties, which, as in all other parallel cases, would present a great variety of constitutions, the result is certainly encouraging. Although these potatoes have made a fair advance in size, considering the smallness of the tubers planted, they are yet quite small compared with the home varieties of the same age, hereafter to be mentioned. This circumstance, connected with the lateness of their maturity, and their constant liability to the black flea, would seem to indicate that they are not the kind which we need in this climate. It seems desirable, therefore, to reproduce them once more, in the hope that from the earliest, strongest, and most sapid of them, others may be obtained free from both the foregoing objections. This result I hope to attain in 1851, not despairing meanwhile of getting some valuable varieties from these above, as they get matured, and better adapted to our short seasons by continuous cultivation.

It is yet a matter of theory, in my own experience, how early seed should be saved from a *perennial* plant or tree. In the case of *annuals*, any seed that is the growth of a good season, and fair soil and cultivation, may be supposed to possess a normal state of vitality. But in the case of *perennials*, it is often found that the first fruit produced does not exhibit the same eminent and permanent qualities that appear when the kind is more matured. Hence it may be inferred that seed should not be saved from the preceding varieties of potatoes until the tubers get their full growth, and so by parity of reason, in all other cases of reproduction of perennials.

The bearing of this experiment, then, on the question, "can we

Digitized by Google

gain anything by the reproduction of foreign varieties of potatoes in this climate?" is certainly favorable. Here is a batch of seedlings, derived from tubers brought from a climate where vegetation never ceases—tubers of whose comparative strength in that climate we have no assurance. And yet these seedlings, in the first generation, exhibit a strength of foliage beyond anything which is seen among our old native varieties. Their plastic character is also seen. The original black tuber, which grew almost inseparably to its stolon, is here changed into red and white of various shades and shapes, and attached to the stolons in the manner of our common varieties. True, they have imperfections, but they lie within the scope of hopeful remedy by further reproduction.

3d. *Home Seedlings of* 1849. a. *Culture in* 1849.

Parallel with the preceding experiment upon Bogota seedlings, was another with seed derived from *home* varieties. The seed-balls were taken in 1848 from the ordinary round red variety. The time and mode of sowing the seeds and cultivating the young plants, were the same as before. The soil into which they were transplanted, was a light sandy loam, a little moister and richer at one end than the other. The transfer from the seed-beds was late, and amid a drought, as in the foregoing case. During their growth, in the latter part of summer, about one-third of them presented wilted leaves on the top of the plant, with steel-blue tips and iron-rust spots on the leaves—appearances which, among other things, I consider unfailing marks of potato disease. They were nearly ripe on the appearance of frost, October 2d, and were dug on the fourth of that month. The tubers were very much larger than in the preceding case. Indeed, many of them were of the size of hens' eggs, and a few were apparently full grown. When dug, the plat (of sixty hills) presented some curious results.

1. Almost all the large and fine looking tubers were diseased, amounting to nearly 30 varieties out of 120. These were of course discarded as unfit for seed.

2. Nearly all that were kidney-shaped, whatever were their color or size, were diseased.

3. The pink-eyes and light reds were diseased in nearly the same degree as the kidneys.

Digitized by Google

4. The purple, deep reds, and whites, were rarely diseased, provided they were not kidney-shaped, as generally they were not.

5. The crop, of whatever color, size or shape, was most diseased towards the end where the soil was richest.

b. *Culture in* 1850.

The seedlings just described having been preserved, each hill apart, through the winter, were planted in a light sandy loam of moderate fertility. I would have preferred a heavier soil, but I had none unappropriated, and, as the season was very wet, it was as well so as in a heavier. The rows were planted so far apart that the foliage never covered all the ground. This was an error, since, from the nature of the soil, it was liable to heat to a high degree, and so the crop suffered the more from the vacancies between the rows being left uncovered.

The ordinary indications of disease were seen later, and much less generally than upon the old varieties. The mildew also, which gave the final and fatal impulse to disease in the old varieties, affected these proportionately less. Indeed, three or four varieties scarcely felt it at all. When dug, there were apparently eighty-one varieties, occupying usually from six to thirty hills each. Numbers of these apparent varieties will doubtless, in the end, prove identical. Of these eighty-one varieties thirty-three exhibited signs of disease, in a few cases extending to one-sixth of the whole produce of that variety, but usually amounting to but two or three tubers, even when, in one case, the sort included thirty-seven hills. Among these thirty-three diseased varieties, twelve were so much affected as to be rejected; the others that were less diseased will be kept on trial another year. Here I noticed that, just as last year,

1. Almost all the kidney-shaped, some few of which had passed the ordeal of 1850, were found diseased.

2. That the largest and most productive varieties, were found, in many instances, most diseased. Is not this a proof that *the excessive development of the tuber is one cause of disease; and does it not become so probably by the appropriation of matter by the tuber needed for the more perfect development of the stems and foliage?* And does there not hence arise the practical suggestion that *whatever will promote a moderate and hardy growth of herbage, such as a*

Digitized by Google

northern exposure, a soil of medium fertility, damp but not wet, with early and deep planting and level culture, will constitute the true policy of cultivation. The farmer should be satisfied with smaller crops of potatoes if he would insure their soundness.

4th. Home Seedlings of 1850.

A portion of the seed of 1848, which was the basis of the preceding experiment, was sown in a coal bed, the last spring. The strength of the plants in the said bed, the timeliness and safety with which they were transplanted, and their early growth, all rendered the experiment much more auspicious than the preceding. But the hot, wet weather of July and August diseased them so rapidly and fatally, that by August 22d, they were nearly all dead. Here is another proof, seen in the comparison of this with the preceding experiment, of the extreme severity of the potato disease this year.

A few of these hills yielded small tubers, which were all sound with one or two exceptions. The reason of the escape of these tubers was doubtless the fact that the severity of disease operated like frost, suddenly paralysing the circulation, and thus preventing the transmission of morbid matter to the tubers. I detail this experiment, not so much for its bearing on the main point before me—the regeneration of the potato, as for its illustration of the violence and mode of action of the disease.

5th. A Chili Potato.

Chili is a long and narrow country, situated on the Pacific coast of South America, in a position of latitude nearly correspondent to the United States of America. It constitutes, with Peru and New-Grenada, the native land of the potato; at least the Spaniards, in the conquest of South America, three hundred and twenty years ago, found the potato extensively cultivated in all these countries.

It has long been known to travellers that the potatoes of Valparaiso, its chief seaport, were among the best in the world. Its inhabitants have a coast trade which extends to the Isthmus of Panama, whither they send potatoes and other productions of their cooler climate. A friend sent me last spring, from Chagres, four Chili potatoes, but one of which grew, the others having suffered too severely in a long sea voyage. It was received May 10th, and was

Digitized by Google

planted the same day. It grew very finely, exhibiting much the appearance of our ordinary sorts. Its growth, however, was a little taller, more graceful, and its foliage of a light green color. It grew through the season with great uniformity and vigor, exhibiting none of the ordinary signs of disease. The influence of the hot and wet weather of July and August, which so fatally mildewed all the common varieties of potatoes, was felt but slightly by this. It was planted in too rich a soil, and in a position where the summer growth of some young fruit trees excluded the free circulation of air. But for these two circumstances I doubt whether it would have been affected at all. It was dug September 7th, its leaves being dead, but its stems still green. Prudential reasons led me to dig it thus early. The original tuber weighed about $2\frac{1}{4}$ ounces, and the crop 3 pounds and 12 ounces, equal to 27 to one. These tubers are red, round, with eyes only moderately deep, and the flesh remarkably white; I need not say that they were entirely sound. The growth of this potato was so natural that it would have been taken by a careless observer, for an ordinary red potato. It must be confessed that this potato has yielded slightly, not to the ordinary causes of disease, but to that unusual one, (hot and wet weather) which gave the disease, this year, so much intensity. In no previous year do I think it would have yielded for a moment. I also believe, as I have said in another article, that, had our potatoes possessed all the vigor of fifty years ago, they would have been more or less diseased this year. This potato then seems to be almost all we could desire, in hardiness, fair productiveness, and whiteness of flesh. Its flavor has not been fully tested, but can scarcely fail of being good. I am sorry to say that it has neither borne seed nor shown the least disposition to flower.

From the known climate of Chili it was to have been anticipated that potatoes brought thence, would be more easily naturalized here than those brought from New-Grenada, and other central portions of South America, where the climate, (though protected alike from the heat and cold of our own) is so mild as to admit of the progress of vegetation all the year. My own experience as here detailed, with tubers from New-Grenada and Chili, justifies such an anticipation.

Digitized by Google

Recapitulation.

1. Here we have a three part experiment. (1.) The cultivation of tubers from New-Grenada and Chili, (2) of seedlings from the former, and (3,) of seedlings from home varieties. The results, though not all that could be wished, in either case, have all been encouraging, since all have exhibited a greater degree of hardiness than any of the old varieties cultivated under my observation, or within my certain knowledge. There are so many considerations entering into the question of the hardiness of a variety of potatoes, considerations that most persons cannot appreciate, that I have learned to put very little confidence in the asserted hardiness of a particular variety, or the success of a particular instance of culture, unless made by a man of the highest intelligence on this subject, who can detect slight traces of disease.

2. There is just encouragement, confidently to anticipate that a continuance of efforts, similar to the above, will be crowned with complete success, especially if we will have the patience to reproduce them repeatedly in as rapid succession as is consistent with full development of vigor.

General Suggestions.

1. The public are probably now convinced that the *causes* of potato disease, be they what they may, are permanent in all the old varieties now cultivated. Something must be done, since this disease has extended itself, though not in an equal degree, to many climes, to all expositions and soils, to all modes of culture, and all old varieties, and through a period, in the United States of America, of eight years.

2. A wise selection of exposition, soil, mode of culture, and variety, aided by the genial influence of an occasional moderate and even season, have given here and there temporary respite, but nothing permanent has been gained.

3. I venture to predict that while we are careless of reproducing them frequently from the seed-balls, while, in our anxiety for large crops, we apply to them a highly stimulating culture, the disease will continue. The present pressure of disease is the result of our climate, and of causes inherent, not only in the potato, but in the nature of all vegetation. The native vigor of the potato enabled

Digitized by Google

it long to resist these causes, but it has at length yielded to them, and will continue to yield except as we regenerate the race and cultivate with more judgment.

4. The potato seems well nigh indispensable as an article of cheap, grateful and useful food. The beet, carrot, parsnep, turnip, and artichoke, though all cheap, valuable and capable of a much wider use than they have yet obtained, can never supply the place of the potato as an article of *human* food Nor do I believe that any other vegetable that exists, and is capable of cultivation in our climate, can supply its place.

5. It were a reproach on the wisdom and benevolence of God, as seen in those fixed principles under which he has organized the vegetable world, to suppose that the cause or causes of this disease are inscrutable to human investigation, or are beyond the reach of remedy. The disease is not, I think, a mystery, (see No. 3, last above,) and is not confined to that plant, but common to most tropicals cultivated in our climate, and frequently affects more hardy plants. The remedy lies in the application of ordinary physiological principles, pervading a course of patient and continued culture. The theory that "the disease is *immediately* dependant on *sudden alternations* of weather, and *remotely* the effect of *exhausted energy*, covers the whole ground of experience; and, when wisely applied, will solve the occurrence of disease in every case.

6. Let there be a united, wise and continued effort to restore the potato. Some will be able to procure tubers from various parts of South America, upon which, and upon the seed derived from them, useful improvements in adaptation and hardiness will be made. Others should direct their attention to the successive reproduction of seed from our hardiest home varieties. Nor must we be discouraged at the length of time, expense, and frequent abortiveness of these efforts. Thus, I believe, that a few years, at farthest, will witness a substantial *regeneration* of the potato crop, one whose effects will be permanent, under the influence of wise culture in future years.

Utica, Dec. 31*st*, 1850.

Digitized by Google

Digitized by Google

Digitized by Google

Digitized by Google

Digitized by Google

Digitized by Google

Digitized by Google

Digitized by Google

Digitized by Google

Digitized by Google

Digitized by Google

Digitized by Google

Digitized by Google

Digitized by Google

Digitized by Google

Digitized by Google